EXCELLENCE IN MACHINE VISION

Coreco Imaging • 7075 Place Robert-Joncas, Suite 142 • St-Laurent, Quebec, H4M 2Z2 • Canada
http://www.imaging.com

Sapera
CAB Programmer's Manual
Edition 5.00

Part number OC-SAPM-CABP0

NOTICE

© 2003 Coreco Inc. All rights reserved.

This document may not be reproduced nor transmitted in any form or by any means, either electronic or mechanical, without the express written permission of Coreco Inc. Every effort is made to ensure the information in this manual is accurate and reliable. Use of the products described herein is understood to be at the user's risk. Coreco Inc. assumes no liability whatsoever for the use of the products detailed in this document and reserves the right to make changes in specifications at any time and without notice.

Microsoft and MS-DOS are registered trademarks; Windows and Windows NT are trademarks of Microsoft Corporation.
All other trademarks or intellectual property mentioned herein belong to their respective owners.

Printed on November 27, 2003

Document Number: OC-SAPM-CABP0

Printed in Canada

Contents

INTRODUCTION 1
OVERVIEW OF THE MANUAL 1
ABOUT THE MANUAL 1
USING THE MANUAL 1

CAB SYSTEM 3
CAB INTERFACE 3
CAB SYSTEM'S FUNCTIONAL ELEMENTS 3
KEY CONCEPTS AND TERMINOLOGY 4
Bus Arbitrator 4
Ports 4
Channels 5
Clock Generator 5
CAB Interface Transfer Modes 6
CAB INTERFACE AND PORT IMPLEMENTATION 7
CONFIGURING A CAB SYSTEM 9
Pre-Power-up Static Configuration 9
Post-Power-up Static Configuration 11
Post-Power-up Dynamic configuration 14
PUTTING IT ALL TOGETHER 20

SAPERA CAB MODULE API 21
CAB MODULE 21
CAPABILITIES 21
PARAMETERS 23
FUNCTIONS 30

TYPICAL CAB CONFIGURATIONS 35
VIPER-DIGITAL/MAMBA-100 IN MULTICAST MODE 35
VIPER-DIGITAL AND MAMBA IN ROUND-ROBIN MODE 39
VIPER-DIGITAL WITH 2 MAMBAS IN MULTICAST MODE 43
VIPER-QUAD/MAMBA IN POINT-TO-POINT MODE 50

CORECO IMAGING CONTACT INFORMATION 51
SALES INFORMATION 51
Corporate Headquarters 51

US Sales Office *51*
TECHNICAL SUPPORT 52

APPENDIX: DUMMY BUFFER TYPE **53**
DUMMY BUFFERS 53
Requirements: *53*
How does it work *53*
How it looks in user applications *54*

GLOSSARY OF TERMS **55**

INDEX **57**

Introduction

Overview of the manual

CAB System
Describes the concepts behind the CAB and how it can be applied within imaging applications.
Sapera CAB Module API
Describes the additional Sapera API required to control the CAB
Typical CAB Configurations
Demonstrates typical board and mode configuration CAB systems with related code examples.
Coreco Imaging Contact Information
Contact, sales, and support information.
Appendix: Dummy Buffer Type
Describes the concept of dummy buffers and how they can be applied.

About the Manual

This manual exists in printed, Windows compiled HTML help, and Adobe Acrobat (PDF) formats. The Help and PDF formats make full use of hypertext cross-references. The PDF format offers links to Coreco Imaging's home page on the Internet located at http://www.imaging.com.

Coreco Imaging's web site contains documents, software updates, demos, errata, utilities, and more.

Using the Manual

File names, directories, and Internet sites will be in bold text (e.g., **setup.exe**, **c:\windows**, **http://www.imaging.com**). Function parameters will be in italics (e.g., *xlen*).

Source code, code examples, text file listings, and text that must be entered using the keyboard will be in typewriter-style text (e.g., `[PixelClock]`).

Menu and dialog actions will be indicated in bold text in the order of the instructions to be executed, with each instruction separated by bullets. For example, going to the **File** menu and choosing **Save** would be written as **File•Save**.

CAB System

CAB Interface

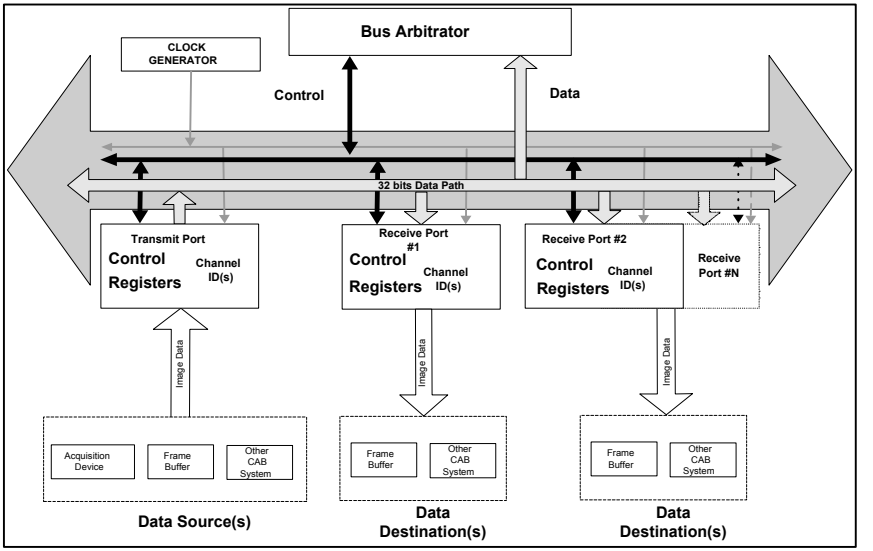
The Coreco Auxiliary Bus (CAB) is a bi-directional synchronous bus capable of transmitting data at a peak rate of 200MB/sec. CAB is required to meet the increasing bandwidth requirement of embedded vision processing applications and to free up the PCI bus for system management and control. For these reasons, all the new generation Coreco Imaging embedded vision processor boards are equipped with the CAB interface.

A CAB system consists of two or more hardware devices containing CAB interfaces.

CAB System's Functional Elements

The CAB system consists of the following functional elements:

- Bus Arbitrator
- Ports
- Channels
- Clock Generator
- CAB Interface Transfer Modes



CAB Functional Block Diagram

Key Concepts and Terminology

The following are concepts and terminology of the CAB.

Bus Arbitrator

The Bus Arbitrator is a functional unit of the CAB system that controls and manages access to the bus. The Bus Arbitrator also decides when and how much data is transferred through the bus.

Ports

A port is defined as a point where the image data is transferred to and taken off from the data bus. There are essentially two types of ports: a transmit port and a receive port.

Transmit Port (TX Port)

A transmit port is a point in the CAB system where data is transferred onto the bus. A hardware device containing one or more transmit ports is called a transmitter. A transmitter can have up to 8 physical transmit ports at the same time. However, the CAB hardware specifications dictate that there can be only one transmitter in the CAB system at any given time. Furthermore, only one transmit port at a time can send data.

Receive Port (RX Port)

The receive port is defined as a point in the CAB system where data is taken off the bus. A hardware device containing the receive port is called a receiver. A receiver can have up to 8 receive ports. Multiple receive ports on multiple receivers can receive data simultaneously.

It is important to note that in order to direct data to a receive port correctly users must assign a channel number(s) to a receive port. The bus arbitrator selects the appropriate receive port(s) based on the channel numbers. The concept of channels is discussed in more detail in a later section.

Through Port

In a typical CAB system the receivers also act as processing nodes. Having more receivers means having more processing power. Some hardware devices, like Mamba-100, contain multiple CAB interfaces. The different CAB interfaces allow a hardware device to be part of different CAB systems. This way one CAB interface can act like a receiver in one CAB system and the second CAB interface can be configured as a transmitter in another CAB system. In other words, two CAB systems can be cascaded to increase the total number of receivers in a given system.

In order to cascade two CAB systems, a receive port is configured in such a way that it sends data to the transmit port of second CAB system located on the hardware device. This type of port is called a through port. Only one receive port on the Receiver can be configured as a through port.

Channels

Channels are required to direct the data flow from a TX port to an RX port. There are 16 channels in every CAB system and are identified as channel 0 through channel 15. The channel numbers are assigned to each transmit and receive port during the parameter initialization. Once a channel number is assigned to a TX port, that same number must be assigned to at least one RX port.

In addition, the following points must be considered:

- For Multicast and Point-to-Point transmission modes (discussed later), multiple channel numbers can be assigned to a single receive port.
- The TX ports can also be assigned multiple channels, although seldom necessary.
- For the Point-to-Point transmission mode, only one channel should be assigned to one TX port.

Clock Generator

The synchronous nature of CAB devices implies the existence of a common clock for the bus arbitrator, transmit port, and receive ports. The clock generator can be located either on the device containing the bus arbitrator, the transmit port, or the receive port.

CAB Interface Transfer Modes

The CAB transfer mode describes the way in which the data is sent and received on the CAB. All modes are mutually exclusive, meaning there can only be one transfer mode active per CAB Interface. The CAB Interface supports 3 different kinds of transfer mode.

Multicast Mode Transfer

The Multicast mode is a data transmission scheme where data is sent to more than one channel simultaneously.

Round-Robin Mode Transfer

The Round-Robin mode of operation can be defined as the mode of data transmission where the destination channel number is incremented sequentially from the start channel to the end channel number.

Point-to-Point Mode Transfer

This is a mode of data transmission where one transmit port sends data to one receive port at any given time. Which transmit and/or receive port where data will be exchanged is selected randomly and is based on the availability of the data at the source.

CAB Interface and Port Implementation

The CAB Interface can be used in various modes; however, the actual port capabilities are hardware implementation dependent. The table below summaries the port capabilities of various CAB Interfaces on different Coreco Imaging embedded vision processors.

Board Type	Mamba		Viper CamLink		Viper Digital		Viper Quad		Viper RGB		Cobra		Python	
CAB Interface	0	1	0	1	0	1	0	1	0	1	0	1	0	1
Number of ports	4	4	1	N/A	1	N/A	4	N/A	1	N/A	1	N/A	4	N/A

Capability	Port Index(ices)													
Transmit														
Multicast	0	0	0	x	0	x	0	x	0	x	0	x	x	x
Round-robin	0	0	0	x	0	x	0	x	0	x	0	x	x	x
Point2Point	0,1 2,3	0,1 2,3	x	x	x	x	0,1 2,3	x	x	x	x	x	x	x
Receive														
Multicast	0	0	x	x	x	x	x	x	x		x		x	x
Round-robin	0,1 2,3	0,1 2,3	x	x	x	x	x	x	x		x		0,1 2,3	x
Point2Point	0,1 2,3	0,1 2,3	x	x	x	x	x	x	x		x		0,1 2,3	x
Pass-Through														
Multicast	0	0	x	x	x	x	x	x	x	x	x		x	x
Round-robin	0	0	x	x	x	x	x	x	x	x	x		x	x
Point2Point	0,1 2,3	0,1 2,3	x	x	x	x	x	x	x	x	x		x	x

Clock/Arbitration Capabilities														
CAB Clock	Drv/ Rcv	CAB Link	Rcv	x	Rcv	x	Rcv	x	Drv	x	Drv		Drv/ Rcv	x
CAB Arbitrator	En/ Dis	Auto	x	x	x	x	x	x	x	x	x		En/ Dis	x

Table Keys
Drv = Able to generate CAB Clock
Rcv = Able to receive CAB Clock from other device
CAB Link = CAB Link hardware provides Clock for Mamba-100 CAB Interface 1
En/Dis = CAB Arbitrator can be Enabled or Disabled
Auto = CAB Link hardware slot position 1 defines Mamba-100 CAB Interface 1 arbitrator
x = Not supported
N/A = Not applicable

Port Indices range from Index 0 through Index 3

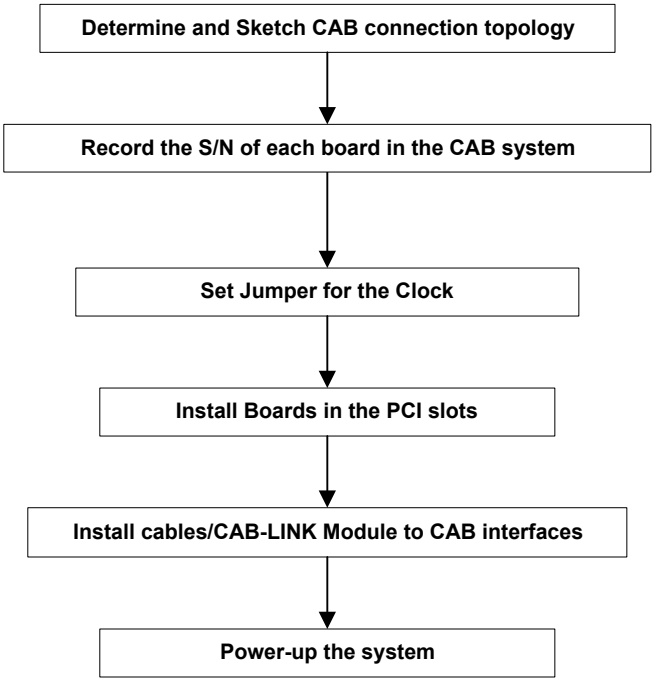
Configuring a CAB System

The process of configuring a CAB System can be divided into the following phases:

1. **Pre-power-up static configuration**
   Configuration steps required before installing into the host computer.
2. **Post-power-up static configuration**
   Configuration of setup parameters in non-volatile memory.
3. **Post-power-up dynamic configuration**
   Configuration sequences required in a Sapera application.

Pre-Power-up Static Configuration

The flow chart and descriptions below suggest a methodology for planning your CAB system. By following these steps closely CAB system rearrangements will be avoided.


Determine and Sketch CAB connection topology
Record the S/N of each board in the CAB system
Set Jumper for the Clock
Install Boards in the PCI slots
Install cables/CAB-LINK Module to CAB interfaces
Power-up the system

Step 1 Determine and Sketch CAB connection topology

As part of the system design, users should determine and sketch how various hardware devices containing CAB interfaces will be connected. In order to facilitate this process, several typical configuration diagrams are provided in the Appendix at the end of this document.

Step 2 Record the serial number of each board in the CAB system

When configuring systems consisting two or more similar CAB devices, it is desirable to relate physical devices with the device names detected by the software. By recording the serial number of the device in a system, users can simplify the identification process. All Coreco Imaging Sapera compliant devices provide device configuration utilities to detect and display the device serial number.

Step 3 Set jumper for the Clock

On some of the Coreco Imaging hardware devices containing a CAB interface, the clock selection is done manually using a jumper setting. Since only one device can supply the clock for the entire CAB system, the clock jumper must be disabled for all other devices in the CAB system. It is, however, important to note that devices containing two CAB interfaces contain two clock sources. Since two CAB interfaces on the same device participate in two separate CAB systems the clock setting for each CAB system is made independently. Refer to the section "CAB Interface and Port Implementation" for specific details concerning the choice of CAB system clock sources relative to the Coreco Imaging hardware used.

Step 4 Install the boards into system

Install the boards in the system as per the topology determined in Step 1 above.

Step 5 Install cables/CAB-LINK module to the CAB interfaces

Once the boards are installed in the system, connect the cables to the appropriate connectors. Refer to the hardware specific user's manual.

Step 6 Power-up the system

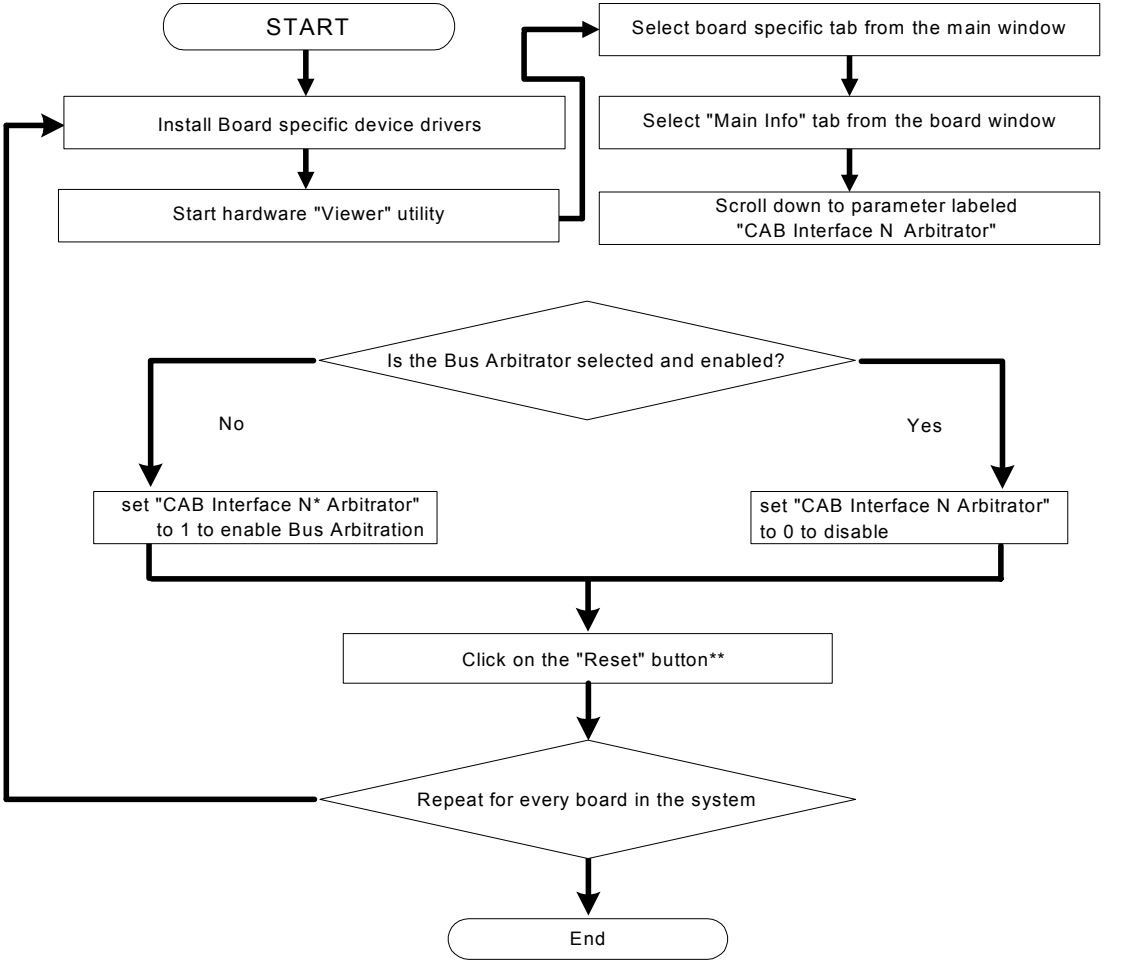
Post-Power-up Static Configuration

The next stage in configuring a CAB system consists of selecting and enabling the bus arbitrator. All CAB interfaces are capable of arbitrating the bus. (Refer to the section "CAB Interface and Port Implementation" for Coreco Imaging board specific details concerning the choice of a CAB system arbitrator).

Note that there can be only one bus arbitrator per CAB system. Therefore, it is crucial to ensure that all CAB interfaces, except one, are disabled. The bus arbitrator feature of the CAB interface is controlled via the register "CAB Interface N Arbitrator" in the board firmware (N is the CAB Interface ID, typically 0 or 1...consult the board specific hardware reference manuals to determine the number and ID of the CAB Interfaces). Users can change this feature via a board specific "Viewer" utility. The "Viewer" utilities are supplied with the board specific device drivers.

The changes to "CAB Interface Arbitrator" take place during the boot-up sequence; therefore, it is important to reset the board for changes to take place.

IMPORTANT: embedded vision processors, like Mamba-100, run on the Windows NT Embedded operation system. Resetting the board arbitrarily can damage the file system. Therefore, the "Shutdown and Restart" option should be selected from the Reset panel of the Mamba-100 Viewer utility.


START
Install Board specific device drivers
Start hardware "Viewer" utility
Select board specific tab from the main window
Select "Main Info" tab from the board window
Scroll down to parameter labeled
"CAB Interface N Arbitrator"
Is the Bus Arbitrator selected and enabled?
No
Yes
set "CAB Interface N* Arbitrator"
to 1 to enable Bus Arbitration
set "CAB Interface N Arbitrator"
to 0 to disable
Click on the "Reset" button**
Repeat for every board in the system
End

* N is the CAB Interface ID. Typically 0 or 1.
Consult board specific Hardware reference Manual to determine number and identify of the CAB Interfaces.

** In case of Mamba click on the "Reset" button and then select "Shutdown and Restart"

Step 1 Install Board Specific Device Drivers

For each Coreco Imaging board in the host system, install that board's device driver. Board drivers are available on the Sapera CD-ROM and also by internet in the download area of the Coreco Imaging web page. Note that the host computer will need to be re-booted.

Step 2 Start Hardware Viewer Utility

For any Coreco Imaging board that has a selectable CAB arbitration mode, that board's viewer utility provides the mechanism to enable or disable arbitration control. From the board's start menu driver program group, run the boards viewer program. Refer to the section "CAB Interface and Port Implementation" for board specific information.

Step 3 and 4 Viewer Program Window

The board viewer program will present a primary tab for each board of that type installed in the host system. Select the primary tab for the board of interest and then select the **Main Info** tab.

Step 5 Using the edit Window

The **Additional Information** scroll window allows editing certain configuration parameters. Double click on the parameter "CAB n Arbitrator : 0" (where n is board dependent). You can now edit the parameter with a value of 0 or 1, where 0 disables that board as CAB arbitrator or 1 enables that board as CAB arbitrator.

Step 6 Reset the Board

To initialize the board with the changed CAB arbitrator setting, click on the board viewer's RESET button.

Step 7 Repeat for Each CAB System Board as Required.

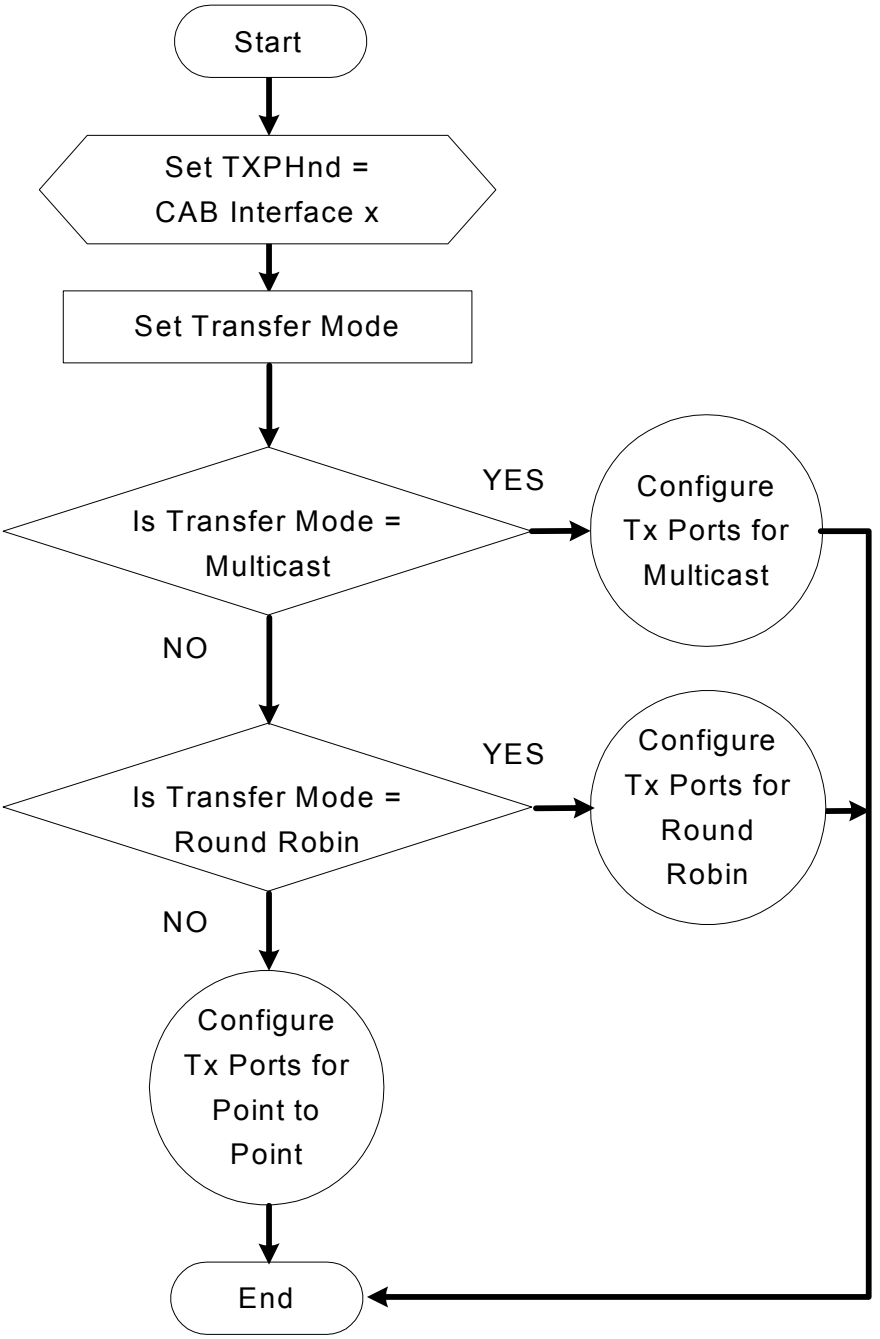
Any other board using the same CAB system and having a selectable arbitrator control must have its CAB arbitrator control enabled or disable so as to have only one CAB system arbitrator active.

Post-Power-up Dynamic configuration

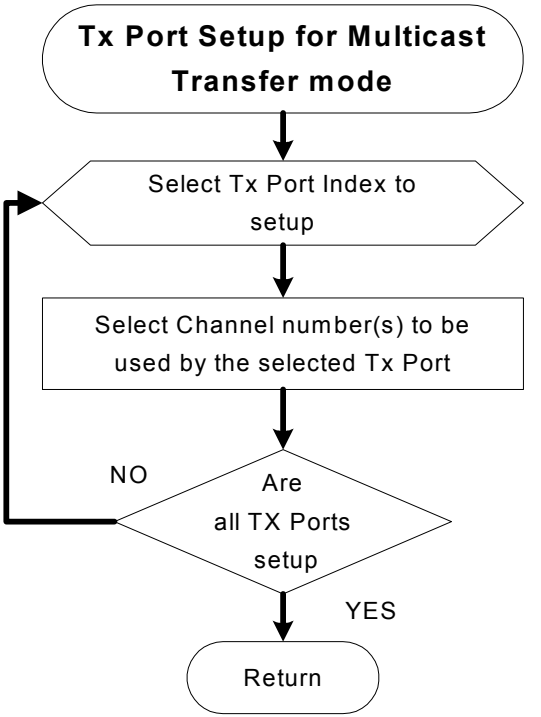
Once the connection topology is selected and the pre and post power-up static configurations are done, the CAB Interfaces must be selected and configured as the transmitter and receivers. This configuration step is made via software control and does not require rebooting or resetting the hardware.

This dynamic configuration is performed by the user using Sapera commands. The section labeled "Putting It All Together" shows skeleton code using Sapera commands to perform dynamic configurations. The following flow-diagrams outline the configuration steps required to configure the CAB transmitter and receivers.

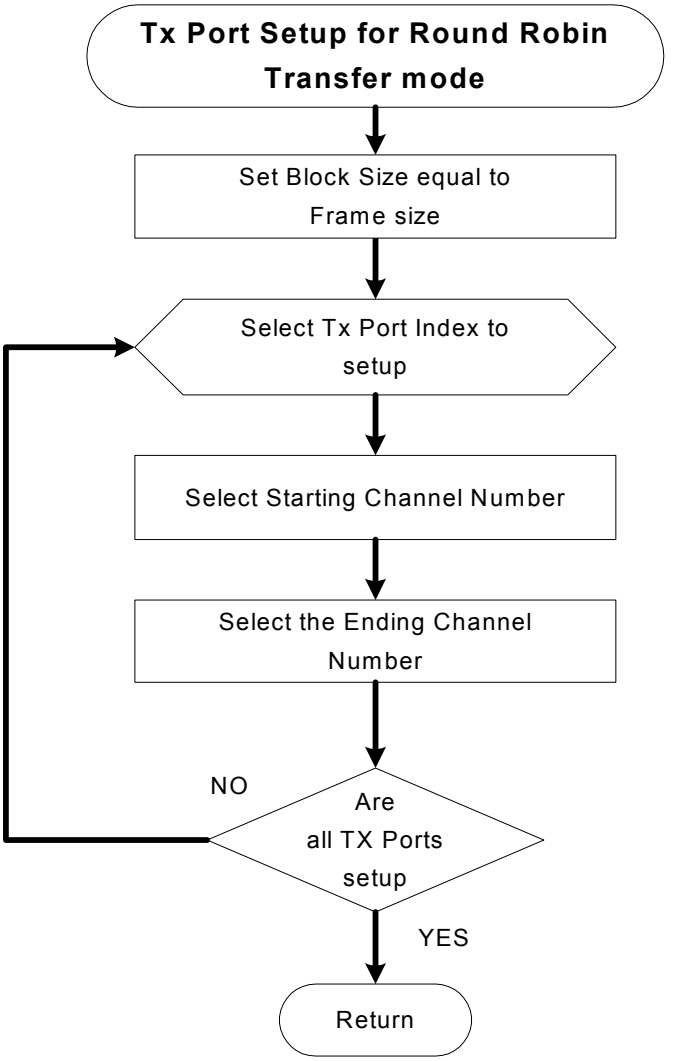
It is important to mention that the parameters required to configure the CAB system bus arbitrator automatically are extracted from the transmitter settings. Users need not configure the CAB system bus arbitrator explicitly.


Start
Set TXPHnd =
CAB Interface x
Set Transfer Mode
Is Transfer Mode =
Multicast
YES
Configure
Tx Ports for
Multicast
NO
Is Transfer Mode =
Round Robin
YES
Configure
Tx Ports for
Round
Robin
NO
Configure
Tx Ports for
Point to
Point
End

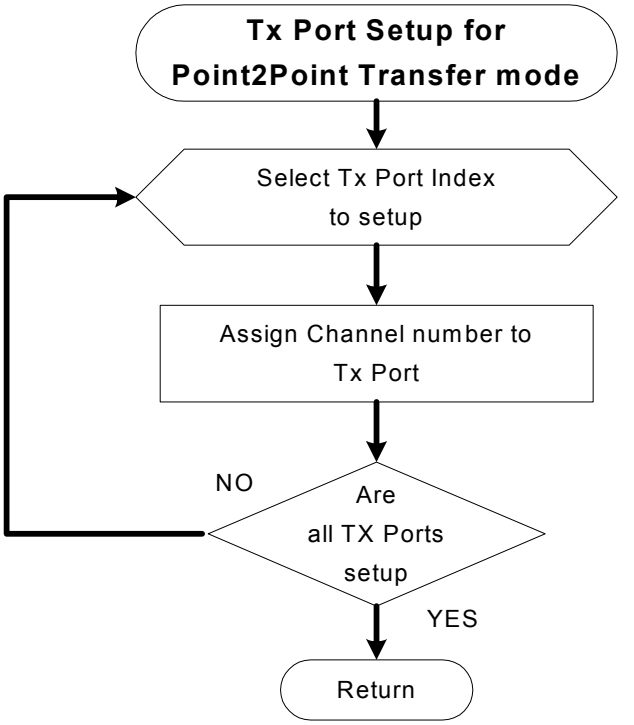
Configuring CAB System Transmitter for Multicast Transfer Mode


Tx Port Setup for Multicast Transfer mode
Select Tx Port Index to setup
Select Channel number(s) to be used by the selected Tx Port
Are all TX Ports setup
NO
YES
Return

Configuring CAB System Transmitter for Round-Robin Transfer Mode

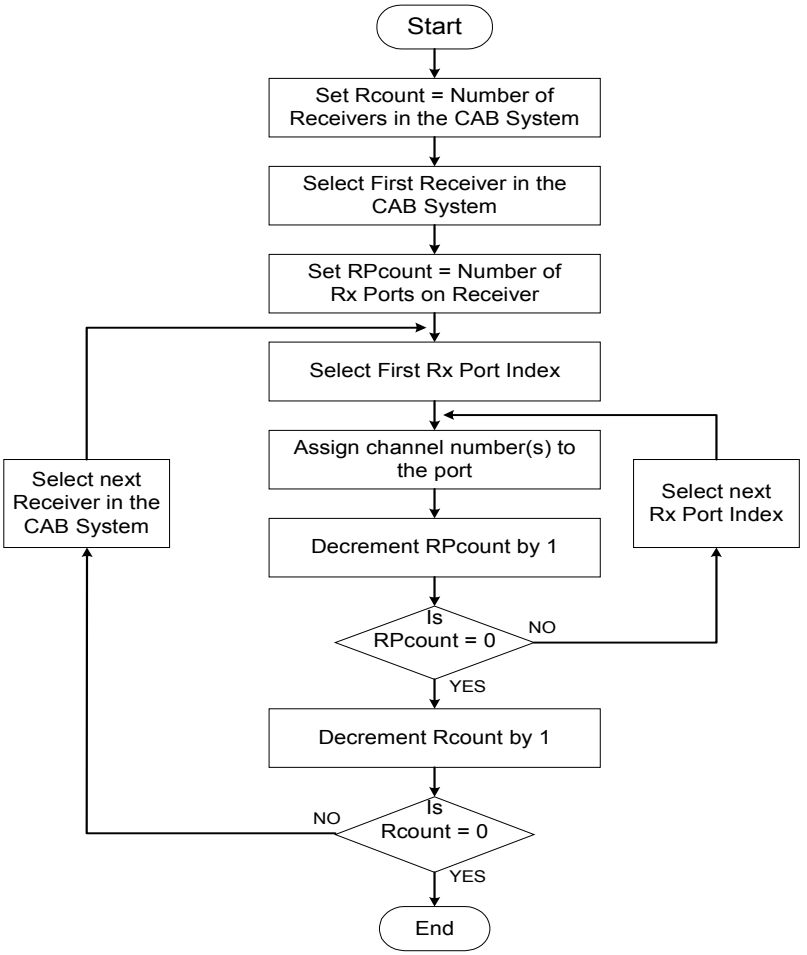

Tx Port Setup for Round Robin Transfer mode
Set Block Size equal to Frame size
Select Tx Port Index to setup
Select Starting Channel Number
Select the Ending Channel Number
Are all TX Ports setup
NO
YES
Return

Configuring CAB System Transmitter for Point-To-Point Transfer Mode



Configuring CAB System Receiver(s)

A CAB System can have one or more receiver. Regardless of the transmission mode, each receive port in the system is configured for one or more channels. The transmission data block size and end of block transfers are controlled by the CAB System's bus arbitrator. The Sapera commands and parameters required to configure the receiver(s) are shown in skeleton code in the next section. The following flow-diagram outlines steps required to configure one or more CAB receivers in the system:


Start
Set Rcount = Number of Receivers in the CAB System
Select First Receiver in the CAB System
Set RPcount = Number of Rx Ports on Receiver
Select First Rx Port Index
Assign channel number(s) to the port
Decrement RPcount by 1
Is RPcount = 0
NO
YES
Select next Rx Port Index
Decrement Rcount by 1
Is Rcount = 0
NO
YES
Select next Receiver in the CAB System
End

Putting It All Together

What we have seen so far:

1. Description of CAB system architecture.
2. Descriptions and definition of CAB terminology.
3. Determining the CAB usage topology and connection diagrams.
4. Description of transmit and receive port capabilities as applicable to various hardware implementation (See table: CAB Interface and Port Implementation).
5. Steps required to configure a CAB system.

What we will see in the section:

1. Physical view of various hardware configurations.
2. CAB System view of the above hardware configurations.
3. Sapera skeleton code to implement the above configurations.

Sapera CAB Module API

CAB Module

The CAB Module controls the Coreco Auxiliary Bus (CAB) and its functions.

Refer to the section "CAB System" (page 3) for a detailed discussion about CAB concepts.

Capabilities

ID	Parameter
0x00	CORCAB_CAP_PORT
0x01	CORCAB_CAP_PORT_COUNT
0x02	CORCAB_CAP_CHANNEL_COUNT
0x03	CORCAB_CAP_CLK_MIN
0x04	CORCAB_CAP_CLK_MAX
0x05	CORCAB_CAP_BLOCK_SIZE_MIN
0x06	CORCAB_CAP_BLOCK_SIZE_MAX

CORCAB_CAP_BLOCK_SIZE_MAX

Description Specifies the maximum data block size (in bytes) that a CAB transmitter can send to the CAB system.

Type UINT32

CORCAB_CAP_BLOCK_SIZE_MIN

Description Specifies the minimum data block size (in bytes) that a CAB transmitter can send to the CAB system.

Type UINT32

CORCAB_CAP_CHANNEL_COUNT

Description Indicates the total number of channels available to the CAB system.

Type UINT32

CORCAB_CAP_CLK_MAX

Description Specifies the maximum CAB clock frequency (in MHz) that the CAB device can generate.

Type UINT32

CORCAB_CAP_CLK_MIN

Description Specifies the minimum CAB clock frequency (in MHz) that the CAB device can generate.

Type UINT32

CORCAB_CAP_PORT

Description Indicates the currently selected port's capability to support the different transfer modes. To select a port, use the parameter CORCAB_PRM_PORT_INDEX.

Type UINT32

Values

CORCAB_VAL_PORT_MULTICAST_RX (0x00000001)
The port supports multicast transfers as a receive port.

CORCAB_VAL_PORT_MULTICAST_TX (0x00000002)
The port supports multicast transfers as a transmit port.

CORCAB_VAL_PORT_MULTICAST_THROUGH (0x00000004)
The port supports multicast transfers as a through port.

CORCAB_VAL_PORT_MULTICAST (0x0000000f)
The port supports multicast transfers as a transmit, receive, and/or through port.

CORCAB_VAL_PORT_ROUND_ROBIN_RX (0x00000010)
The port supports round robin transfers as a receive port.

CORCAB_VAL_PORT_ROUND_ROBIN_TX (0x00000020)
The port supports round robin transfers as a transmit port.

CORCAB_VAL_PORT_ROUND_ROBIN_THROUGH (0x00000040)
The port supports round robin transfers as a through port.

CORCAB_VAL_PORT_ROUND_ROBIN (0x000000f0)
The port supports round robin transfers as a transmit, receive, and/or through port.

CORCAB_VAL_PORT_POINT_TO_POINT_RX (0x00000100)
The port supports point-to-point transfers as a receive port.

CORCAB_VAL_PORT_POINT_TO_POINT_TX (0x00000200)
The port supports point-to-point transfers as a transmit port.

CORCAB_VAL_PORT_POINT_TO_POINT_THROUGH (0x00000400)
The port supports point-to-point transfers as a through port.

CORCAB_VAL_PORT_POINT_TO_POINT (0x00000f00)
The port supports point-to-point transfers as a transmit, receive, and/or through port.

CORCAB_VAL_PORT_RX (0x00000111)
The port can be a receive port from the CAB system using one of the available transfer modes.

CORCAB_VAL_PORT_TX (0x00000222)
The port can be a transmit port on the CAB system using one of the available transfer modes.

CORCAB_VAL_PORT_THROUGH (0x00000444)
The port can receive and transmit from one CAB system to another using one of the available transfer modes.

Note The returned value is the ORed combination of the valid values.

CORCAB_CAP_PORT_COUNT

Description Indicates the total number of ports available on the CAB device.

Type UINT32

Parameters

ID	Parameter
0x00	CORCAB_PRM_TRANSFER_MODE
0x01	* CORCAB_PRM_DST_CHANNEL
0x02	* CORCAB_PRM_DST_CHANNEL_FIRST
0x03	* CORCAB_PRM_DST_CHANNEL_LAST
0x04	CORCAB_PRM_BLOCK_SIZE
0x05	CORCAB_PRM_LABEL
0x06	*CORCAB_PRM_CAB_ID
0x07	CORCAB_PRM_CAB_ARBITRATOR
0x08	CORCAB_PRM_CAB_CLK
0x09	*CORCAB_PRM_SRC_CHANNEL_FIRST
0x0a	*CORCAB_PRM_SRC_CHANNEL_LAST
0x0b	CORCAB_PRM_CAB_CLK_GENERATOR
0x0c	CORCAB_PRM_STATUS
0x0d	CORCAB_PRM_CHANNEL
0x0e	CORCAB_PRM_CONNECTION_SIGNAL
0x0f	CORCAB_PRM_PORT_INDEX

* Obsolete parameters

CORCAB_PRM_BLOCK_SIZE

Description The size of the blocks of data (in bytes) transmitted to the CAB system by a CAB transmitter. This parameter must be set by the CAB transmitter. It has no meaning for a CAB receiver. The size of the block will depend on the transfer mode selected:

CORCAB_VAL_TRANSFER_MODE_MULTICAST:
The parameter is not used.

CORCAB_VAL_TRANSFER_MODE_ROUND_ROBIN:
the parameter represents the number of bytes sent to a transmission channel before the transmission channel is switched to the next one. If one wants to process one image per CAB device, then one would set the block size to the number of bytes in a frame.

CORCAB_VAL_TRANSFER_MODE_POINT_TO_POINT:
The parameter represents the number of bytes sent to a transmission channel before the transmission channel is switched to another one. On a transmit port hooked to an acquisition device, this parameter can be read-only. In this case, the value is valid for reading once the CAB device gets connected with the function CorXferConnect.

Type UINT32

Values Numerical value within the range [CORCAB_CAP_BLOCK_SIZE_MIN...CORCAB_CAP_BLOCK_SIZE_MAX] representing the size of each block (in bytes). Must be a multiple of 4 bytes.

Note This parameter applies to all the ports of a CAB transmitter.

CORCAB_PRM_CAB_CLK

Description The CAB clock is the main clock on the bus that controls the CAB arbitrator and FIFOs.

Type UINT32

Values CAB clock frequency in MHz in the range:
CORCAB_CAP_CLK_MIN...CORCAB_CAP_CLK_MAX

Note When more than 2 CAB receivers are connected to a CAB system, the CAB clock might need to be slowed down to take into account the extra load on the bus.

See also CORCAB_PRM_CAB_CLK_GENERATOR

CORCAB_PRM_CAB_CLK_GENERATOR

Description This parameter indicates if the CAB device generates the CAB clock. The CAB clock is the one that controls the flow of data for a CAB system. Only one CAB device can be the clock generator.

Type UINT32

Values TRUE
The CAB device generates the CAB clock.

FALSE
The CAB device does not generate the CAB clock. Another CAB device is the CAB clock generator.

Note On some boards, this parameter cannot be programmed and/or detected. See the specific board's user's manual for more information about the CAB clock generator.

See also CORCAB_PRM_CAB_CLK

CORCAB_PRM_CAB_ID

Description This parameter is obsolete. Use the parameter CORCAB_PRM_CHANNEL.

CORCAB_PRM_CAB_ARBITRATOR

Description This parameter indicates if the CAB device is the CAB arbitrator. The CAB arbitrator is the one that controls the CAB system. Only one CAB device can be the CAB arbitrator.

Type UINT32

Values TRUE
The CAB device is the arbitrator on the CAB system.

FALSE
The CAB device is not the arbitrator on the CAB system.

Note On some boards, this parameter cannot be programmed. See the specific board's user's manual for more information about setting the board as the CAB arbitrator.

CORCAB_PRM_CHANNEL

Description Transmit or receiving channel(s) associated with the currently selected port. To select a port, use the parameter CORCAB_PRM_PORT_INDEX.

Refer to the section "Channels" on page 5 for a more detailed description concerning the concept of channels.

Type UINT32

Values

CORCAB_VAL_CHANNEL_0 (0x00000001)
CAB Channel 0

CORCAB_VAL_CHANNEL_1 (0x00000002)
CAB Channel 1

CORCAB_VAL_CHANNEL_2 (0x00000004)
CAB Channel 2

CORCAB_VAL_CHANNEL_3 (0x00000008)
CAB Channel 3

CORCAB_VAL_CHANNEL_4 (0x00000010)
CAB Channel 4

CORCAB_VAL_CHANNEL_5 (0x00000020)
CAB Channel 5

CORCAB_VAL_CHANNEL_6 (0x00000040)
CAB Channel 6

CORCAB_VAL_CHANNEL_7(0x00000080)
CAB Channel 7

CORCAB_VAL_CHANNEL_8 (0x00000100)
CAB Channel 8

CORCAB_VAL_CHANNEL_9 (0x00000200)
CAB Channel 9

CORCAB_VAL_CHANNEL_10 (0x00000400)
CAB Channel 10

CORCAB_VAL_CHANNEL_11 (0x00000800)
CAB Channel 11

CORCAB_VAL_CHANNEL_12 (0x00001000)
CAB Channel 12

CORCAB_VAL_CHANNEL_13 (0x00002000)
CAB Channel 13

CORCAB_VAL_CHANNEL_14(0x00004000)
CAB Channel 14

CORCAB_VAL_CHANNEL_15 (0x00008000)
CAB Channel 15

Note The values may be ORed if more than one channel is desired.

CORCAB_PRM_CONNECTION_SIGNAL

Description The connection signal is used to determine the CAB devices that are physically connected to the same CAB system. By setting this parameter to TRUE, one activates a signal on the CAB system that can be monitored by all the other CAB devices connected to the CAB system by reading the parameter CORCAB_PRM_STATUS and verifying if the CORCAB_PRM_STATUS_CONNECTION_SIGNAL bit is active.

Type UINT32

Values TRUE
Activate the connection signal.

FALSE
Deactivate the connection signal.

CORCAB_PRM_DST_CHANNEL

Description Obsolete. Use instead the equivalent parameter CORCAB_PRM_CHANNEL

CORCAB_PRM_DST_CHANNEL_FIRST

Description This parameter is obsolete. Use the parameter CORCAB_PRM_CHANNEL.

First destination or transmission channel when the parameter CORCAB_PRM_TRANSFER_MODE is set to CORCAB_VAL_TRANSFER_MODE_ROUND_ROBIN.

Type UINT32

Values Numerical value within the range [0...15] representing the first destination channel ID.

Note CORCAB_PRM_DST_CHANNEL_FIRST parameter must be lower than or equal to the CORCAB_PRM_DST_CHANNEL_LAST parameter.

CORCAB_PRM_DST_CHANNEL_LAST

Description This parameter is obsolete. Use the parameter CORCAB_PRM_CHANNEL.

Last destination or transmission channel when the parameter CORCAB_PRM_TRANSFER_MODE is set to CORCAB_VAL_TRANSFER_MODE_ROUND_ROBIN.

Type UINT32

Values Numerical value within the range [0...15] representing the last destination channel ID.

Note CORCAB_PRM_DST_CHANNEL_LAST parameter must be greater than or equal to the CORCAB_PRM_DST_CHANNEL_FIRST parameter.

CORCAB_PRM_FRAME_LENGTH

Description Obsolete. Use instead the equivalent parameter CORCAB_PRM_BLOCK_SIZE.

CORCAB_PRM_LABEL

Description The CAB device's string ID.

Type Zero-terminated array of characters with a fixed size of 128 bytes.

Values CORCAB_PRM_LABEL is a read-only parameter.

CORCAB_PRM_PORT_INDEX

Description Specifies the port number that is active. By selecting a new active port, the following parameters will be updated to reflect the current state of the port: CORCAB_PRM_CHANNEL and CORCAB_CAP_PORT

Type UINT32

Values Active port number: 0 .. CORCAB_CAP_PORT_COUNT- 1

CORCAB_PRM_SRC_CHANNEL_FIRST

Description This parameter is obsolete. Use the parameter CORCAB_PRM_CHANNEL.

First source or receiving channel when the parameter CORCAB_PRM_TRANSFER_MODE is set to CORCAB_VAL_TRANSFER_MODE_ROUND_ROBIN.

Type UINT32

Values Numerical value within the range [0...15] representing the first source channel ID.

Note This parameter must be lower than or equal to the parameter CORCAB_PRM_SRC_CHANNEL_LAST.

CORCAB_PRM_SRC_CHANNEL_LAST

Description This parameter is obsolete. Use the parameter CORCAB_PRM_CHANNEL.

Last source or receiving channel when the parameter CORCAB_PRM_TRANSFER_MODE is set to CORCAB_VAL_TRANSFER_MODE_ROUND_ROBIN.

Type UINT32

Values Numerical value within the range [0...15] representing the last source channel ID.

Note This parameter must be greater than or equal to the parameter CORCAB_PRM_SRC_CHANNEL_FIRST.

CORCAB_PRM_STATUS

Description Returns information about the current status of the CAB system.

Type UINT32

Values CORCAB_VAL_STATUS_GRANTED (0x00000001)
The CAB system is considered GRANTED if a CAB transmitter has been granted transmission rights to the CAB system by the CAB arbitrator. Only one CAB transmitter can be granted permission to transmit to the CAB system. Once the CAB system is granted, no CAB parameters can be changed. The CAB system is granted to a CAB transmitter once it is connected using the function CorXferConnect, the CAB transmitter being one of the destination pair(s) of the transfer module.

CORCAB_VAL_STATUS_CONNECTION_SIGNAL (0x00000002)
The connection signal bit is active if a CAB device connected to the CAB system has activated the signal using the parameter CORCAB_PRM_CONNECTION_SIGNAL. The connection signal status is useful in determining which CAB devices are connected to a CAB system when multiple CAB systems are present in a system.

Note The returned value is the ORed combination of the valid values.

This parameter is read-only.

CORCAB_PRM_TRANS_MODE

Description Obsolete. Use instead the equivalent parameter CORCAB_PRM_TRANSFER_MODE

CORCAB_PRM_TRANSFER_MODE

Description Controls CAB system data routing. This parameter must be set by the CAB transmitter. It has no meaning for a CAB receiver.

Type UINT32

Values CORCAB_VAL_TRANSFER_MODE_MULTICAST (0x00000000)
One source to one or more simultaneous destinations

CORCAB_VAL_TRANSFER_MODE_ROUND_ROBIN (0x00000001)
One source to 2 or more destinations in round robin fashion

CORCAB_VAL_TRANSFER_MODE_POINT_TO_POINT (0x00000010)
Multiple sources, each going to a single destination.

Note This parameter applies to all the ports of a CAB transmitter.

Refer to the CAB User's manual for more information about the different types of transfer mode.

Functions

Function	Description
CorCabGetCap	*Gets CAB capability value from a CAB device*
CorCabGetCount	*Gets the number of CAB devices on a server*
CorCabGetHandle	*Gets a handle to a CAB device*
CorCabGetPrm	*Gets CAB parameter value from a CAB device*
CorCabGetPrms	*Gets multiple CAB parameters from a CAB device*
CorCabRelease	*Releases handle to a CAB device*
CorCabReset	*Resets a CAB device*
CorCabResetModule	*Resets the resources associated with the server's CAB device(s)*
CorCabSetPrm	*Sets a simple CAB parameter of a CAB device*
CorCabSetPrms	*Sets multiple CAB parameters of a CAB device*
CorCabSetPrmEx	*Sets a complex CAB parameter of a CAB device*

CorCabGetCap

Get CAB capability value from a CAB device

Prototype	CORSTATUS **CorCabGetCap**(CORCAB *hCab*, UINT32 *cap*, void **value*);	
Description	Gets CAB capability value from a CAB device.	
Input	*hCab*	CAB device handle
	cap	The CAB device capability requested
Output	*value*	Value of the capability
Return Value	CORSTATUS_INVALID_HANDLE CORSTATUS_CAP_INVALID CORSTATUS_ARG_NULL (if *value* is NULL)	

CorCabGetCount

Get the number of CAB devices on a server

Prototype	CORSTATUS **CorCabGetCount**(CORSERVER *hServer*, UINT32 **count*);	
Description	Gets the number of CAB devices on a server.	
Input	*hServer*	Server handle
Output	*count*	Number of CAB devices
Return Value	CORSTATUS_INVALID_HANDLE CORSTATUS_ARG_NULL (if *count* is NULL)	
Note	The content of *count* is 0 when there is no CAB device available.	

CorCabGetHandle

Get a handle to a CAB device

Prototype	CORSTATUS **CorCabGetHandle**(CORSERVER *hServer*, UINT32 *index*, CORCAB **hCab*);	
Input	*hServer*	Server handle
	index	Specifies which CAB device to select. Valid values are in the range [0...*count*-1], where *count* is the value returned by CorCabGetCount.
Output	*hCab*	CAB resource handle
Return Value	CORSTATUS_INVALID_HANDLE CORSTATUS_ARG_NULL CORSTATUS_NO_MEMORY	
See Also	CorCabGetCount (page 30), CorCabRelease (page 32)	

CorCabGetPrm

Get CAB parameter value from a CAB device

Prototype	CORSTATUS **CorCabGetPrm**(CORCAB *hCab*, UINT32 *prm*, void **value*);	
Description	Gets CAB parameter value from a CAB device.	
Input	*hCab*	CAB resource handle
		CAB parameter requested
Output	*value*	Current value of the parameter
Return Value	CORSTATUS_INVALID_HANDLE CORSTATUS_ARG_NULL CORSTATUS_PRM_INVALID	
See Also	CorCabSetPrm (page 33), CorCabGetPrms (page 31), CorCabSetPrmEx (page 34), CorCabSetPrms (page 33)	

CorCabGetPrms

Get multiple CAB parameters from a CAB device

Prototype	CORSTATUS **CorCabGetPrms**(CORCAB *hCab*, CORPARAM *hParam*);	
Description	Gets multiple CAB parameters from a CAB device.	
Input	*hCab*	CAB resource handle
	hParam	Parameters resource handle
Output	None	
Return Value	CORSTATUS_INVALID_HANDLE CORSTATUS_PRM_INVALID CORSTATUS_PRM_READ_ONLY	
See Also	**CorParamSave** function in the *Sapera Basic Modules Reference Manual* (available as online version only)	

CorCabRelease

Release handle to a CAB device

Prototype	CORSTATUS **CorCabRelease**(CORCAB *hCab*);
Description	Releases handle to a CAB device.
Input	*hCab* CAB resource handle
Output	None
Return Value	CORSTATUS_INVALID_HANDLE
See Also	CorCabGetHandle (page 31)

CorCabReset

Reset a CAB device

Prototype	CORSTATUS **CorCabReset**(CORCAB *hCab*);
Description	Resets a CAB device. Restores the default values of CAB parameters of the specified CAB device.
Input	*hCab* CAB resource handle
Output	None
Return Value	CORSTATUS_INVALID_HANDLE

CorCabResetModule

Reset the resources associated with the server's CAB device(s)

Prototype	CORSTATUS **CorCabResetModule**(CORSERVER *hServer*);
Description	Resets the resources associated with the server's CAB device(s). It will release all of the resources (handle, memory) currently allocated. When using this function, make certain that no other application is currently using any CAB device resource. This function should be use with caution.
Input	*hServer* Server handle
Output	None
Return Value	CORSTATUS_INVALID_HANDLE

CorCabSetPrm

Set a simple CAB parameter of a CAB device

Prototype	CORSTATUS **CorCabSetPrm**(CORCAB *hCab*, UINT32 *prm*, UINT32 *value*);	
Description	Sets a simple CAB parameter of a CAB device.	
Input	*hCab*	CAB resource handle
		CAB parameter to set
Output	None	
Return Value	CORSTATUS_ARG_INVALID_VALUE CORSTATUS_ARG_OUT_OF_RANGE CORSTATUS_INVALID_HANDLE CORSTATUS_PRM_INVALID CORSTATUS_PRM_READ_ONLY	
See Also	CorCabGetPrm (page 31), CorCabSetPrms (page 33), CorCabSetPrmEx (page 34), CorCabGetPrms (page 31)	

CorCabSetPrms

Set multiple CAB parameters of a CAB device

Prototype	CORSTATUS **CorCabSetPrms** (CORCAB *hCab*, CORPARAM *hParam*);	
Description	Sets multiple CAB parameter of a CAB device.	
Input	*hCab*	CAB resource handle
	hParam	Parameters resource handle
Output	None	
Return Value	CORSTATUS_ARG_INVALID_VALUE (internal hParam argument) CORSTATUS_ARG_OUT_OF_RANGE (internal hParam argument) CORSTATUS_INVALID_HANDLE CORSTATUS_PRM_INVALID CORSTATUS_PRM_READ_ONLY	
See Also	**CorParamLoad** function in the *Sapera Basic Modules Reference Manual* (available as online version only)	

CorCabSetPrmEx

Set a complex CAB parameter of a CAB device

Prototype	CORSTATUS **CorCabSetPrmEx**(CORCAB *hCab*, UINT32 *prm*, const void **value*);	
Description	Sets a complex CAB parameter of a CAB device.	
Input	*hCab*	CAB resource handle
	prm	CAB parameter to set
	value	New value of the parameter
Output	None	
Return Value	CORSTATUS_ARG_INVALID_VALUE CORSTATUS_ARG_NULL CORSTATUS_ARG_OUT_OF_RANGE CORSTATUS_INVALID_HANDLE CORSTATUS_PRM_INVALID CORSTATUS_PRM_READ_ONLY	
Note	A complex parameter is one whose size is greater than an UINT32. If the parameter size is UINT32, either CorCabSetPrm or CorCabSetPrmEx can be used.	
See Also	CorCabGetPrm (page 31), CorCabSetPrm (page 33)	

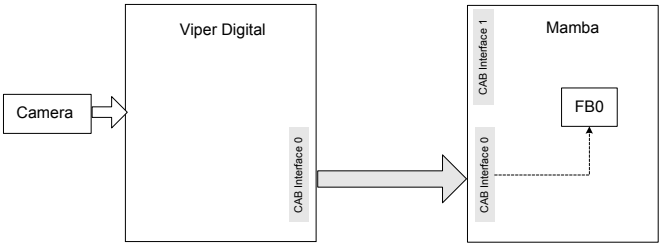
Typical CAB Configurations

Viper-Digital/Mamba-100 in Multicast Mode

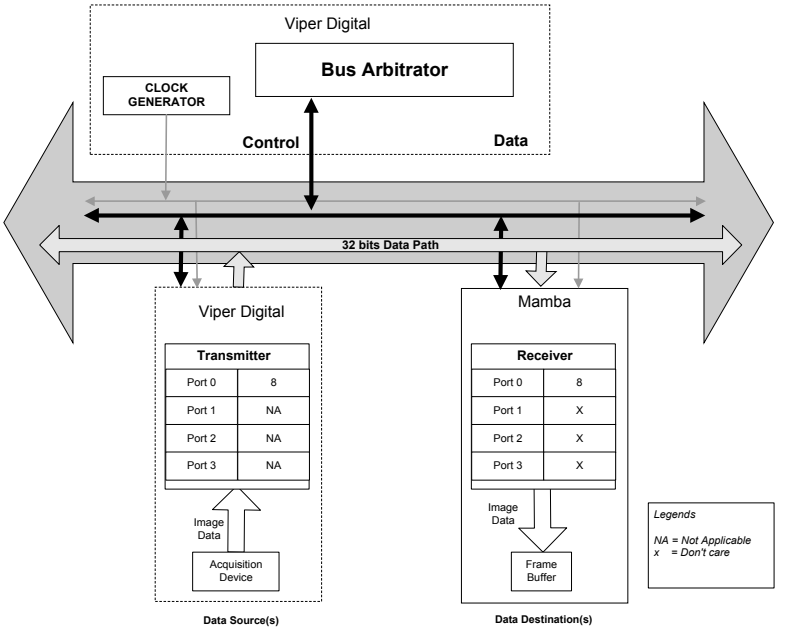
Using Viper Digital and Mamba in Multicast mode

- Single node architecture

Hardware Connection Diagram



CAB System View



```
// Assumes the following physical setup:
//- one Viper-Digital
//- two Mamba-100s
//- Cab interface of Viper is connected to Cab interface 0 of Mamba_1
//- Cab interface 1 of Mamba_1 is connected to Cab interface 1 of Mamba_2

CORSERVER hServer_VD1;
CORSERVER hServer_Mamba1;
CORSERVER hServer_Mamba2;

CORCAB hCAB_Intf0_VD1;
CORCAB hCAB_Intf0_Mamba1;
CORCAB hCAB_Intf1_Mamba1;
CORCAB hCAB_Intf1_Mamba2;

CORXFER hXfer_VD1_Acq_To_CAB_Intf0;
CORXFER hXfer_Mamba1_CAB_Intf0_To_Buffer0;
CORXFER hXfer_Mamba2_CAB_Intf1_To_Buffer0;

CORBUFFER hBuffer_Mamba1[4];
CORBUFFER hBuffer_Mamba2;

CORXFER_DESC xferDesc;

int main()
{
// Used when transferring from a Mamba-100 Cab interface to a Mamba-100 buffer only
xferDesc.frame = CORXFER_VAL_FRAME_INTERLACED;
xferDesc.fieldOrder = CORXFER_VAL_FIELD_ORDER_ODD_EVEN;
xferDesc.widthByte = 640;
xferDesc.height = 480;
xferDesc.incByte = 640;

//  This example shows how to setup Multicast mode of transmission in a single
//  CAB system configuration
//Test 1 assumes the following physical setup:
//                                    - one Viper-Digital
//                                    - one Mamba-100
//                                    - Cab interface of Viper is connected to Cab
interface 0 of Mamba-100
//
// Transfer is:
//- multicast mode on Cab interface of Viper
//- one buffer on port 0 of Cab interface 0 of the Mamba-100
SetupTest1();
DoTest1();
CleanupTest1();
}

void SetupTest1(void)
{

// The following commands assume that the users has reviewed the hardware architecture
// of the boards and is using the CAB Interface 0 of the boards.
// Obtain handles to Board servers using name. This allows code to be executed
// transparently either the host or on the Mamba-100 1

//  Retrieve Server handles
CorManGetServerByName("Viper_Digital_1", &hServer_VD1);
```

```
CorManGetServerByName("Mamba_1", &hServer_Mamba1);

//  retrieve CAB Interface 0 handle from the board server
CorCabGetHandle(hServer_VD1, 0, &hCAB_Intf0_VD1);
CorCabGetHandle(hServer_Mamba1, 0, &hCAB_Intf0_Mamba1);

// ************  Start of Transmitter settings ******************
// Critical Parameters:
//TRANSFER_MODE = Multicast
//      Channel number = 8
//
//      Block Size =  For Multicast block size is not needed.

//Select the Tx_Port on the CAB Interface to work with.
CorCabSetPrm(hCAB_Intf0_VD1, CORCAB_PRM_PORT_INDEX, 0);

//Set the transmission mode for Viper digital CAB Interface 0(The Transmitter).
CorCabSetPrm(hCAB_Intf0_VD1, CORCAB_PRM_TRANSFER_MODE,
CORCAB_VAL_TRANSFER_MODE_MULTICAST);

//Assign channel number to the TX_Port
CorCabSetPrm(hCAB_Intf0_VD1, CORCAB_PRM_CHANNEL, CORCAB_VAL_CHANNEL_8);

// ************  End of Transmitter settings ******************

// ************  Start of Receiver settings ***********************
// Critical Parameters:
//Transfer Mode                   =   Not needed
//Channel Number                  =   One of the channel numbers used for the Tx_port
//Block size                      =   Not needed
//
//The CORCAB_CAP_PORT_COUNT capability can be used to determine the number of port on
//the CAB Interface.
//Notice: since Mamba-100 CAB Interface will be used as the receiver, setting up the
//transmission mode is not necessary.

//Select the Rx_Port on the CAB Interface to work with.
CorCabSetPrm(hCAB_Intf0_Mamba1, CORCAB_PRM_PORT_INDEX, 0);

//Assign channel number to the RX_Port
CorCabSetPrm(hCAB_Intf0_Mamba1, CORCAB_PRM_CHANNEL, CORCAB_VAL_CHANNEL_8);
// ************  End of Receiver settings ***********************


//The following command creates a frame buffer in Mamba 1 system memory.
CorBufferNew(hServer_Mamba1, 640, 480, CORBUFFER_VAL_FORMAT_MONO8,
CORBUFFER_VAL_TYPE_CONTIGUOUS, &hBuffer_Mamba1[0]));
}

void DoTest1(void)
{
// ************************* Start of Connection Setup  ************************
//Creates logical connections between the frame buffer(the final destination of data)
//and the Rx_ports on the Receiver.

CorXferNewEx(hServer_Mamba1, hCAB_Intf0_Mamba1, 0, hBuffer_Mamba1[0], 0, &xferDesc,
&hXfer_Mamba1_CAB_Intf0_To_Buffer0);
```

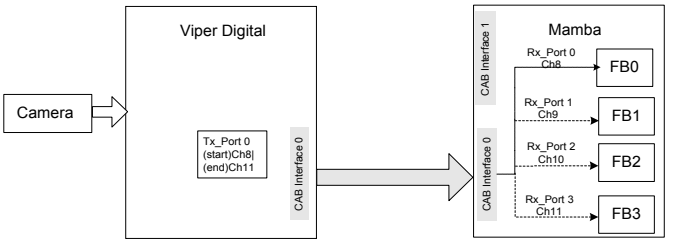
```
// Sets physical routing of the Receiver to the CAB and from the Receiver to the
buffer CorXferConnect(hXfer_Mamba1_CAB_Intf0_To_Buffer0);
// Final destination where
// receiver sends the data


//Creates logical connections between the acquisition front end (the initial source of
//data) and the Tx_ports on the Transmitter.

CorXferNew(hServer_VD1, hAcq, hCAB_Intf0_VD1, NULL, &hXfer_VD1_Acq_To_CAB_Intf0));

//Sets physical routing of the Transmitter to the CAB and from the acquisition front
//end to the Transmitter.
CorXferConnect(hXfer_VD1_Acq_To_CAB_Intf0);

// ************************ End of Connection Setup ************************

// ************************ Start of Image Acquisition ********************
//Notice: the order in which Image acquisition and image transfer starts.
//Initialize the receivers to receive from CAB before initializing Transmitter to
//send data to the CAB.

CorXferStart(hXfer_Mamba1_CAB_Intf0_To_Buffer0, 1);
CorXferStart(hXfer_VD1_Acq_To_CAB_Intf0, 1);

//wait for the transfers to finish

CorXferWait(hXfer_Mamba1_CAB_Intf0_To_Buffer0, 2000);
CorXferWait(hXfer_VD1_Acq_To_CAB_Intf0, 2000);

CorXferDisconnect(hXfer_Mamba1_CAB_Intf0_To_Buffer0);
CorXferDisconnect(hXfer_VD1_Acq_To_CAB_Intf0);

// ************************ End of Image Acquisition ********************

CorXferFree(hXfer_Mamba1_CAB_Intf0_To_Buffer0);
CorXferFree(hXfer_VD1_Acq_To_CAB_Intf0);
}
void CleanupTest1(void)
{
CorAcqRelease(hAcq);
CorCabRelease(hCAB_Intf0_VD1);
CorManReleaseServer(hServer_VD1);

CorBufferFree(hBuffer_Mamba1[0]);
CorCabRelease(hCAB_Intf0_Mamba1);
CorManReleaseServer(hServer_Mamba1);
}
```

Viper-Digital and Mamba in Round-Robin Mode

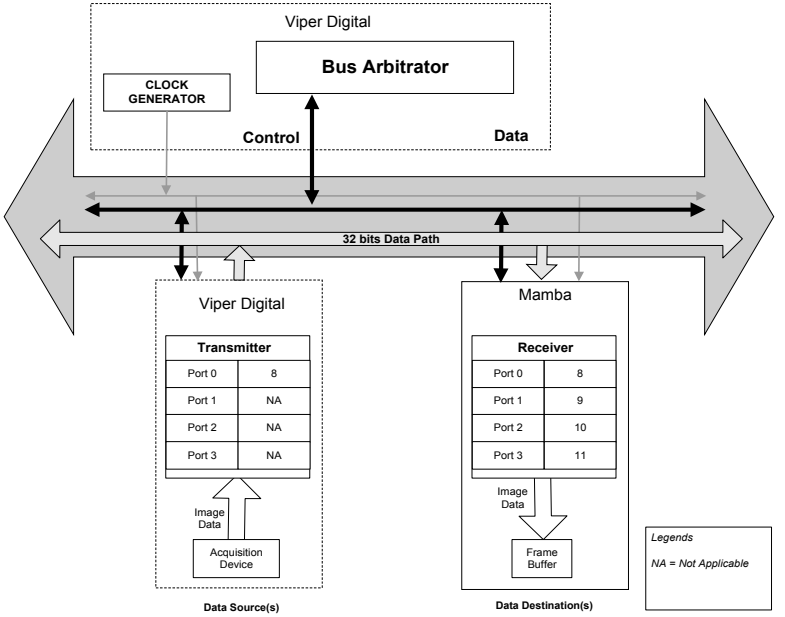
Using Viper Digital and Mamba in Round Robin mode

- Single node architecture

Hardware Connection Diagram



CAB System View



```
// Assumes the following physical setup:
//- one Viper-Digital
//- two Mambas
//- Cab interface of Viper is connected to Cab interface 0 of Mamba_1
//- Cab interface 1 of Mamba_1 is connected to Cab interface 1 of Mamba_2

CORSERVER hServer_VD1;
CORSERVER hServer_Mamba1;
CORSERVER hServer_Mamba2;

CORCAB hCAB_Intf0_VD1;
CORCAB hCAB_Intf0_Mamba1;
CORCAB hCAB_Intf1_Mamba1;
CORCAB hCAB_Intf1_Mamba2;

CORXFER hXfer_VD1_Acq_To_CAB_Intf0;
CORXFER hXfer_Mamba1_CAB_Intf0_To_Buffer0;
CORXFER hXfer_Mamba2_CAB_Intf1_To_Buffer0;

CORBUFFER hBuffer_Mamba1[4];
CORBUFFER hBuffer_Mamba2;

CORXFER_DESC xferDesc;

int main()
{
// Used when transferring from a Mamba Cab interface to a Mamba buffer only
xferDesc.frame = CORXFER_VAL_FRAME_INTERLACED;
xferDesc.fieldOrder = CORXFER_VAL_FIELD_ORDER_ODD_EVEN;
xferDesc.widthByte = 640;
xferDesc.height = 480;
xferDesc.incByte = 640;

//The next example shows how to setup Round Robin mode of transmission in a single CAB
//system configuration
//Test 2 assumes the following physical setup:
//- one Viper-Digital
//- one Mamba
//- Cab interface of Viper is connected to Cab interface 0 of Mamba
//
// Transfer is:
//- round-robin mode on Cab interface of Viper
//- one buffer on port 0 of Cab interface 0 of the Mamba
//- one buffer on port 1 of Cab interface 0 of the Mamba
//- one buffer on port 2 of Cab interface 0 of the Mamba
//- one buffer on port 3 of Cab interface 0 of the Mamba
SetupTest2();
DoTest2();
CleanupTest2();

return 0;
}


void SetupTest2(void)
{
//The following commands assume that the users has reviewed the hardware architecture
//of the boards and is using the CAB Interface 0 of the boards.
//Obtain handles to Board servers using name. This allows code to be executed
```

```
//transparently either on the host or on the Mamba 1

// Retrieve server handles by name
CorManGetServerByName("Viper_Digital_1", &hServer_VD1);
CorManGetServerByName("Mamba_1", &hServer_Mamba1);


// Retrieve CAB_Interface 0 handle on each of the board server
CorCabGetHandle(hServer_VD1, 0, &hCAB_Intf0_VD1);
CorCabGetHandle(hServer_Mamba1, 0, &hCAB_Intf0_Mamba1);

// ********************* Start of Transmitter Setup ***************************
// Critical Parameters
//CORCAB_PRM_TRANSFER_MODE        =   Round Robin (Required)
//CORCAB_PRM_BLOCK_SIZE           =   frame size (required)
//CORCAB_PRM_CHANNEL              =   start and end channels. Channel numbers
//between start and end channel numbers are
//incremented at the end of each transfer.
//
CorCabSetPrm(hCAB_Intf0_VD1, CORCAB_PRM_TRANSFER_MODE,
CORCAB_VAL_TRANSFER_MODE_ROUND_ROBIN);
CorCabSetPrm(hCAB_Intf0_VD1, CORCAB_PRM_BLOCK_SIZE, 640 * 480);

// Start channel                   =   8
// End channel                     =   11
CorCabSetPrm(hCAB_Intf0_VD1, CORCAB_PRM_CHANNEL,CORCAB_VAL_CHANNEL_8 |
CORCAB_VAL_CHANNEL_11);


// ********************* End of Transmitter Setup ***************************


// ********************* Start of Receiver Setup ***************************
// Critical Parameters
//CORCAB_PRM_TRANSFER_MODE        =   not needed
//CORCAB_PRM_BLOCK_SIZE           =   not needed
//CORCAB_PRM_CHANNEL              =   One or more channels per Rx_Port
//Channel number must correspond to one or more
//channels #s programmed for one or more Tx_Port.
//Select the Rx_port before initializing the Channel number

CorCabSetPrm(hCAB_Intf0_Mamba1, CORCAB_PRM_PORT_INDEX, 0);
CorCabSetPrm(hCAB_Intf0_Mamba1, CORCAB_PRM_CHANNEL, CORCAB_VAL_CHANNEL_8);

CorCabSetPrm(hCAB_Intf0_Mamba1, CORCAB_PRM_PORT_INDEX, 1);
CorCabSetPrm(hCAB_Intf0_Mamba1, CORCAB_PRM_CHANNEL, CORCAB_VAL_CHANNEL_9);

CorCabSetPrm(hCAB_Intf0_Mamba1, CORCAB_PRM_PORT_INDEX, 2);
CorCabSetPrm(hCAB_Intf0_Mamba1, CORCAB_PRM_CHANNEL, CORCAB_VAL_CHANNEL_10);

CorCabSetPrm(hCAB_Intf0_Mamba1, CORCAB_PRM_PORT_INDEX, 3);
CorCabSetPrm(hCAB_Intf0_Mamba1, CORCAB_PRM_CHANNEL, CORCAB_VAL_CHANNEL_11);


// ********************* End of Receiver Setup ***************************

// ******************* Start of Frame buffer allocation *******************
//The following section allocates the frame buffers and stores handles of the
//frame buffer in an array of handles
```

```
CorBufferNew(hServer_Mamba1, 640, 480, CORBUFFER_VAL_FORMAT_MONO8,
CORBUFFER_VAL_TYPE_CONTIGUOUS, &hBuffer_Mamba1[0]));
CorBufferNew(hServer_Mamba1, 640, 480, CORBUFFER_VAL_FORMAT_MONO8,
CORBUFFER_VAL_TYPE_CONTIGUOUS, &hBuffer_Mamba1[1]));
CorBufferNew(hServer_Mamba1, 640, 480, CORBUFFER_VAL_FORMAT_MONO8,
CORBUFFER_VAL_TYPE_CONTIGUOUS, &hBuffer_Mamba1[2]));
CorBufferNew(hServer_Mamba1, 640, 480, CORBUFFER_VAL_FORMAT_MONO8,
CORBUFFER_VAL_TYPE_CONTIGUOUS, &hBuffer_Mamba1[3]));

// ****************** End of Frame buffer allocation ********************
}
void DoTest2(void)
{
//************************* Start of Receiver Connection Setup
                            ************************
//Creates logical connections between the frame buffer(the final destination of data)
//and the Rx_ports on the Receiver.

CorXferNewEx(hServer_Mamba1, hCAB_Intf0_Mamba1, 0, hBuffer_Mamba1[0], 0, &xferDesc,
&hXfer_Mamba1_CAB_Intf0_To_Buffer0);
CorXferAppendEx(hXfer_Mamba1_CAB_Intf0_To_Buffer0, hCAB_Intf0_Mamba1, 1,
hBuffer_Mamba1[1], 0, &xferDesc));
CorXferAppendEx(hXfer_Mamba1_CAB_Intf0_To_Buffer0, hCAB_Intf0_Mamba1, 2,
hBuffer_Mamba1[2], 0, &xferDesc));
CorXferAppendEx(hXfer_Mamba1_CAB_Intf0_To_Buffer0, hCAB_Intf0_Mamba1, 3,
hBuffer_Mamba1[3], 0, &xferDesc));

// Sets physical routing of the Receiver to the CAB and from the Receiver to the
buffer
CorXferConnect(hXfer_Mamba1_CAB_Intf0_To_Buffer0);

//*************** Start of Transmitter Connection Setup ************************
//Creates logical connections between the acquisition front end (the initial source of
//data) and the Tx_ports on the Transmitter.

CorXferNew(hServer_VD1, hAcq, hCAB_Intf0_VD1, NULL, &hXfer_VD1_Acq_To_CAB_Intf0));

//Sets physical routing of the Transmitter to the CAB and from the acquisition front
//end to the Transmitter.
CorXferConnect(hXfer_VD1_Acq_To_CAB_Intf0);
// ********************** End of Transmitter Connection Setup **********************

// ************************ Start of Image Acquisition ********************
//Notice, the order in which Image acquisition and image transfer starts.
//Initialize the receivers to receive from CAB before initializing Transmitter to send
//data to the CAB.
CorXferStart(hXfer_Mamba1_CAB_Intf0_To_Buffer0, 4);
CorXferStart(hXfer_VD1_Acq_To_CAB_Intf0, 4);

CorXferWait(hXfer_Mamba1_CAB_Intf0_To_Buffer0, 2000);
CorXferWait(hXfer_VD1_Acq_To_CAB_Intf0, 2000);

CorXferDisconnect(hXfer_Mamba1_CAB_Intf0_To_Buffer0);
CorXferDisconnect(hXfer_VD1_Acq_To_CAB_Intf0);

// ************************ End of Image Acquisition ********************

CorXferFree(hXfer_Mamba1_CAB_Intf0_To_Buffer0);
```

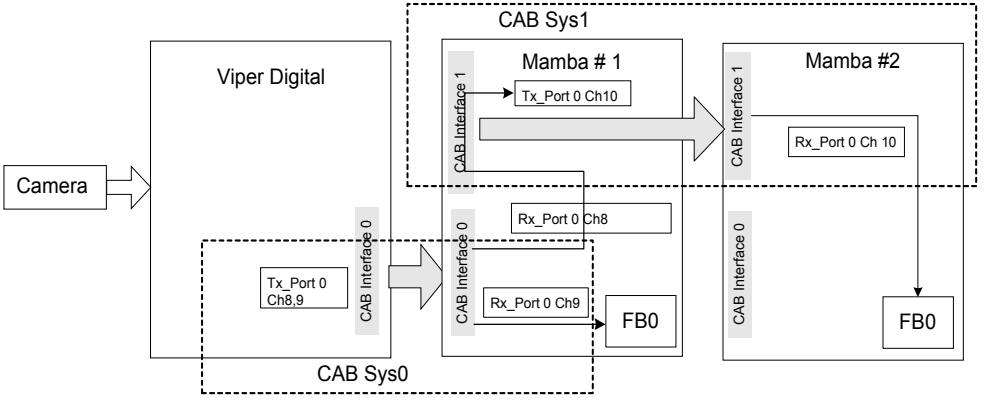
```
CorXferFree(hXfer_VD1_Acq_To_CAB_Intf0);
}


void CleanupTest2(void)
{
CorAcqRelease(hAcq);
CorCabRelease(hCAB_Intf0_VD1);
CorManReleaseServer(hServer_VD1);

CorBufferFree(hBuffer_Mamba1[0]);
CorBufferFree(hBuffer_Mamba1[1]);
CorBufferFree(hBuffer_Mamba1[2]);
CorBufferFree(hBuffer_Mamba1[3]);
CorCabRelease(hCAB_Intf0_Mamba1);
CorManReleaseServer(hServer_Mamba1);
}
```

Viper-Digital with 2 Mambas in Multicast Mode

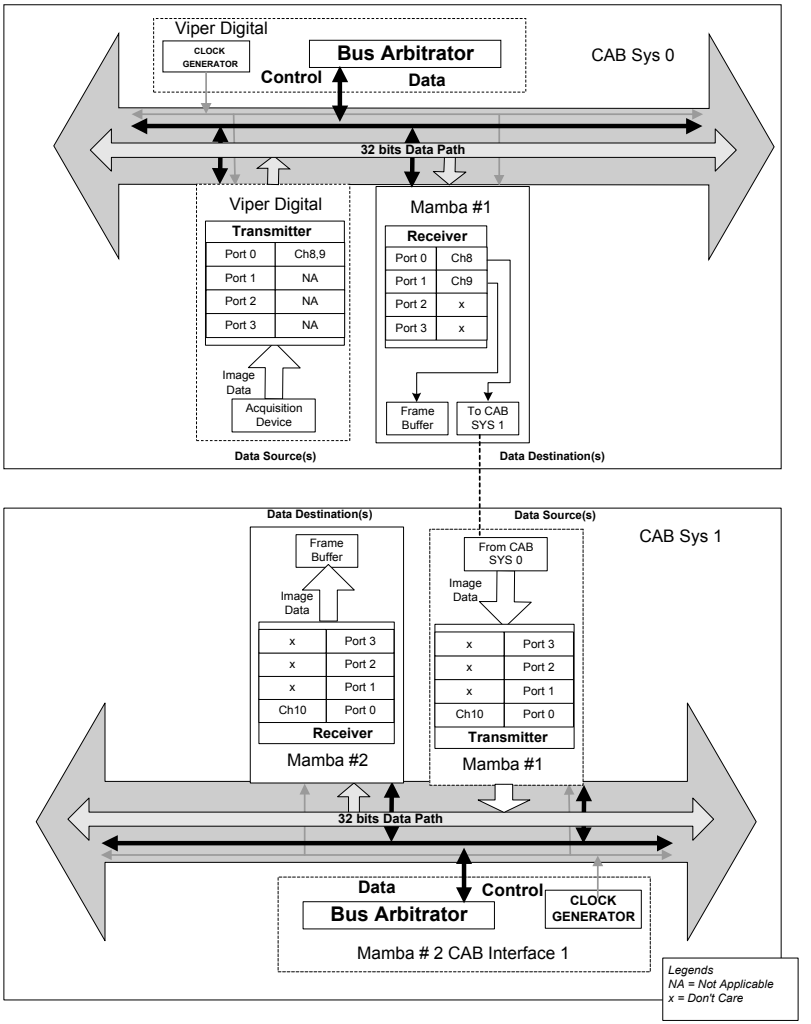
Using Viper Digital with 2 Mambas in Multicast mode

Multi-node Architecture

Hardware Connection Diagram



CAB System View



```
// Assumes the following physical setup:
//- one Viper-Digital
//- two Mambas
//- Cab interface of Viper is connected to Cab interface 0 of Mamba_1
//- Cab interface 1 of Mamba_1 is connected to Cab interface 1 of Mamba_2

CORSERVER hServer_VD1;
CORSERVER hServer_Mamba1;
CORSERVER hServer_Mamba2;

CORCAB hCAB_Intf0_VD1;
CORCAB hCAB_Intf0_Mamba1;
CORCAB hCAB_Intf1_Mamba1;
CORCAB hCAB_Intf1_Mamba2;

CORXFER hXfer_VD1_Acq_To_CAB_Intf0;
CORXFER hXfer_Mamba1_CAB_Intf0_To_Buffer0;
CORXFER hXfer_Mamba2_CAB_Intf1_To_Buffer0;

CORBUFFER hBuffer_Mamba1[4];
CORBUFFER hBuffer_Mamba2;

CORXFER_DESC xferDesc;


int main()
{
// Used when transferring from a Mamba Cab interface to a Mamba buffer only
xferDesc.frame = CORXFER_VAL_FRAME_INTERLACED;
xferDesc.fieldOrder = CORXFER_VAL_FIELD_ORDER_ODD_EVEN;
xferDesc.widthByte = 640;
xferDesc.height = 480;
xferDesc.incByte = 640;

// The next example shows how to setup multiple CAB systems in multicast mode
//
// Test 3 assumes the following physical setup:
//- one Viper-Digital
//- two Mambas
//- Cab interface of Viper is connected to Cab interface 0 of Mamba_1
//- Cab interface 1 of Mamba_1 is connected to Cab interface 1 of Mamba_2
//
// Transfer is:
//- multicast mode on Cab interface of the Viper
//- passthrough from port 0 of Cab interface 0 to port 0 of Cab interface 1 on
//Mamba_1
//- one buffer on port 1 of Cab interface 0 of Mamba_1
//- multicast mode from port 0 of Cab interface 1 of Mamba_1
//- one buffer on port 0 of Cab interface 1 on Mamba_2
SetupTest3();
DoTest3();
CleanupTest3();

return 0;
}

void SetupTest3(void)
{
```

```
//The following commands assume that the users has reviewed the hardware architecture
//of the boards and is using the CAB Interface 0 of the boards.
//Obtain handles to Board servers using name. This allows code to be executed
//transparently either on the host or on the Mamba 1.

//Retrieve server handles by name
CorManGetServerByName("Viper_Digital_1", &hServer_VD1);
CorManGetServerByName("Mamba_1", &hServer_Mamba1);
CorManGetServerByName("Mamba_2", &hServer_Mamba2);

//Retrieve CAB_Interface 0 handle from the board server

CorCabGetHandle(hServer_VD1, 0, &hCAB_Intf0_VD1);
CorCabGetHandle(hServer_Mamba1, 0, &hCAB_Intf0_Mamba1);

// Retrieve CAB_Interface 1 handle from the board servers
CorCabGetHandle(hServer_Mamba1, 0, &hCAB_Intf1_Mamba1);
CorCabGetHandle(hServer_Mamba2, 1, &hCAB_Intf1_Mamba2);


//******************** Start of Transmitter Setup on CabSys 0
**************************
//Critical Parameters
//CORCAB_PRM_TRANSFER_MODE        =   Multicast (Required)
//CORCAB_PRM_BLOCK_SIZE           =   not needed
//CORCAB_PRM_CHANNEL              =   As needed (Required)


CorCabSetPrm(hCAB_Intf0_VD1, CORCAB_PRM_TRANSFER_MODE,
CORCAB_VAL_TRANSFER_MODE_MULTICAST);
CorCabSetPrm(hCAB_Intf0_VD1, CORCAB_PRM_CHANNEL,
CORCAB_VAL_CHANNEL_8 | CORCAB_VAL_CHANNEL_9);

// ******************** End of Transmitter Setup on CabSys 0 ************************


// ******************** Start of Receiver Setup On CabSys 0 ************************
// Critical Parameters
//CORCAB_PRM_TRANSFER_MODE        =   not needed
//CORCAB_PRM_BLOCK_SIZE           =   not needed
//CORCAB_PRM_CHANNEL              =   One or more channels per Rx_Port
//Channel number must correspond to one or more
//channels #s programmed for one or more Tx_Port.
//Select the Rx_port before initializing the Channel number
CorCabSetPrm(hCAB_Intf0_Mamba1, CORCAB_PRM_PORT_INDEX, 0);
CorCabSetPrm(hCAB_Intf0_Mamba1, CORCAB_PRM_CHANNEL, CORCAB_VAL_CHANNEL_8);
CorCabSetPrm(hCAB_Intf0_Mamba1, CORCAB_PRM_PORT_INDEX, 1);
CorCabSetPrm(hCAB_Intf0_Mamba1, CORCAB_PRM_CHANNEL, CORCAB_VAL_CHANNEL_9);

// ******************** End of Receiver Setup On CabSys 0 ************************


// ******************** Start of Transmitter Setup on CABSys 1
************************
// Critical Parameters
//CORCAB_PRM_TRANSFER_MODE        =   Multicast (Required)
//CORCAB_PRM_BLOCK_SIZE           =   not needed
//CORCAB_PRM_CHANNEL              =   As needed (Required)
```

```
CorCabSetPrm(hCAB_Intf1_Mamba1, CORCAB_PRM_PORT_INDEX, 0);
CorCabSetPrm(hCAB_Intf1_Mamba1, CORCAB_PRM_TRANSFER_MODE,
CORCAB_VAL_TRANSFER_MODE_MULTICAST);
CorCabSetPrm(hCAB_Intf1_Mamba1, CORCAB_PRM_CHANNEL, CORCAB_VAL_CHANNEL_10);

// ********************* End of Transmitter Setup on CABSys 1 ************************

// ********************* Start of Receiver Setup on CABSys 1 *************************
// Critical Parameters
//CORCAB_PRM_TRANSFER_MODE        =   not needed
//CORCAB_PRM_BLOCK_SIZE           =   not needed
//CORCAB_PRM_CHANNEL              =   One or more channels per Rx_Port
//Channel number must correspond to one or more channels #s programmed for one or more
//Tx_Port.
//Select the Rx_port before initializing the Channel number

CorCabSetPrm(hCAB_Intf1_Mamba2, CORCAB_PRM_PORT_INDEX, 0);
CorCabSetPrm(hCAB_Intf1_Mamba2, CORCAB_PRM_CHANNEL, CORCAB_VAL_CHANNEL_10);

// ***************** Start of Receiver Setup on CABSys 1 ***************************


// ******************* Start of Frame buffer allocation ********************
//The following section allocates the frame buffers and stores handles of the
//frame buffer in an array of handles

CorBufferNew(hServer_Mamba1, 640, 480, CORBUFFER_VAL_FORMAT_MONO8,
CORBUFFER_VAL_TYPE_CONTIGUOUS, &hBuffer_Mamba1[0]));

CorBufferNew(hServer_Mamba2, 640, 480, CORBUFFER_VAL_FORMAT_MONO8,
CORBUFFER_VAL_TYPE_CONTIGUOUS, &hBuffer_Mamba2));

// ******************* End of Frame buffer allocation ********************
}

void DoTest3(void)
{
// ***************** Start of Receiver Connection Setup for CABSys 1 ****************
//IMPORTANT:
//1) Notice the order in which connections are made:  CABSys N, Receiver X to
//Receiver X-1, X-2, ..0 and Transmitter A
//
//CABSys N -1, Receiver Y to Receiver Y-1, Y-2 .. 0 and Transmitter B
//
//.......
//
//CABSys 0 , Receiver Z to Receiver Z-1, Z-2 .. 0 and Transmitter C
//
//
//2) Also notice how to CASCADE CAB Systems to add processing nodes.
//Creates logical connections between the frame buffer(the final destination of data)
//and the Rx_ports on the  Receiver.

CorXferNewEx(hServer_Mamba2, hCAB_Intf1_Mamba2, 0, hBuffer_Mamba2, 0, &xferDesc,
&hXfer_Mamba2_CAB_Intf1_To_Buffer0);
CorXferConnect(hXfer_Mamba2_CAB_Intf1_To_Buffer0);

// ***************** End of Receiver Connection Setup for CABSys 1 *******************
```

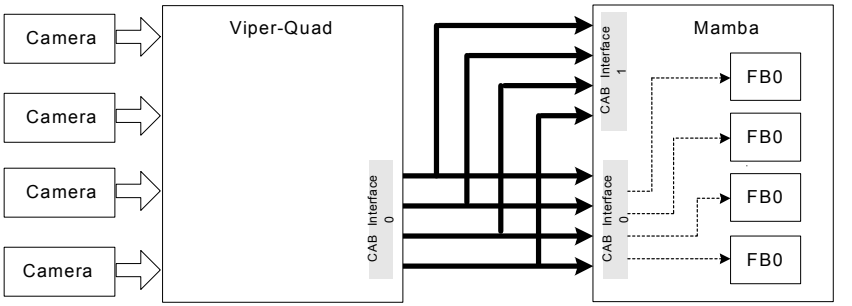
```
// ******** Start of Receiver & Cascading Connection Setup for CABSys 0 **************
//Cascading CABSYS0 to CABSYS 1
//IMPORTANT Notice: the Rx_port 0 of the CAB Interface 0 of Mamba 1 is cascading
//("passing-through") the data to Tx_Port 0 of the Mamba 1. Notice, the user must
//assign channel number to Rx_Port and Tx_port, however, the channel numbers do not
//have to be identical for two reasons:
//1. Rx_Port and Tx_port belong to two separate CAB systems.
//2. The hardware performs physical connection between Rx_port(of CABSys 0) and
//Tx_Port(of CABSys1)
//creates logical mapping to connect the CAB interface 0 to CAB interface 1 of Mamba 1
//(passthrough mode)
CorXferNewEx(hServer_Mamba1, hCAB_Intf0_Mamba1, 0, hCAB_Intf1_Mamba1, 0, NULL,
&hXfer_Mamba1_CAB_Intf0_To_Buffer0);


// creates logical mapping to connect the Frame buffers on Mamba 1 to the Rx_Port of
CAB Interface 0
CorXferAppendEx(hXfer_Mamba1_CAB_Intf0_To_Buffer0, hCAB_Intf0_Mamba1, 1,
hBuffer_Mamba1[0], 0, &xferDesc));

// Establish physical links using the logical mapping done in the previous step.
CorXferConnect(hXfer_Mamba1_CAB_Intf0_To_Buffer0);

// *********** Start of Receiver & Cascading Connection Setup for CABSys 0 ***********

// *********** Start of Transmitter Connection Setup for CABSys 0 ********************
CorXferNew(hServer_VD1, hAcq, hCAB_Intf0_VD1, NULL, &hXfer_VD1_Acq_To_CAB_Intf0));
CorXferConnect(hXfer_VD1_Acq_To_CAB_Intf0);
// *********** End of Transmitter Connection Setup for CABSys 0 **********************

// ************************ Start of Image Acquisition *******************
//Notice, the order in which Image acquisition and image transfer starts.
//Initialize the receivers to receive from CAB before initializing Transmitter to send
//data to the CAB.

CorXferStart(hXfer_Mamba2_CAB_Intf1_To_Buffer0, 1);
CorXferStart(hXfer_Mamba1_CAB_Intf0_To_Buffer0, 1);
CorXferStart(hXfer_VD1_Acq_To_CAB_Intf0, 1);

CorXferWait(hXfer_Mamba2_CAB_Intf1_To_Buffer0, 2000);
CorXferWait(hXfer_Mamba1_CAB_Intf0_To_Buffer0, 2000);
CorXferWait(hXfer_VD1_Acq_To_CAB_Intf0, 2000);

CorXferDisconnect(hXfer_Mamba2_CAB_Intf1_To_Buffer0);
CorXferDisconnect(hXfer_Mamba1_CAB_Intf0_To_Buffer0);
CorXferDisconnect(hXfer_VD1_Acq_To_CAB_Intf0);

// ************************ End of Image Acquisition *******************

CorXferFree(hXfer_Mamba2_CAB_Intf1_To_Buffer0);
CorXferFree(hXfer_Mamba1_CAB_Intf0_To_Buffer0);
CorXferFree(hXfer_VD1_Acq_To_CAB_Intf0);
}


void CleanupTest3(void)
{
CorAcqRelease(hAcq);
CorCabRelease(hCAB_Intf0_VD1);
```

```
CorManReleaseServer(hServer_VD1);

CorBufferFree(hBuffer_Mamba1[0]);
CorCabRelease(hCAB_Intf0_Mamba1);
CorCabRelease(hCAB_Intf1_Mamba1);
CorManReleaseServer(hServer_Mamba1);

CorBufferFree(hBuffer_Mamba2);
CorCabRelease(hCAB_Intf1_Mamba2);
CorManReleaseServer(hServer_Mamba2);
}
```

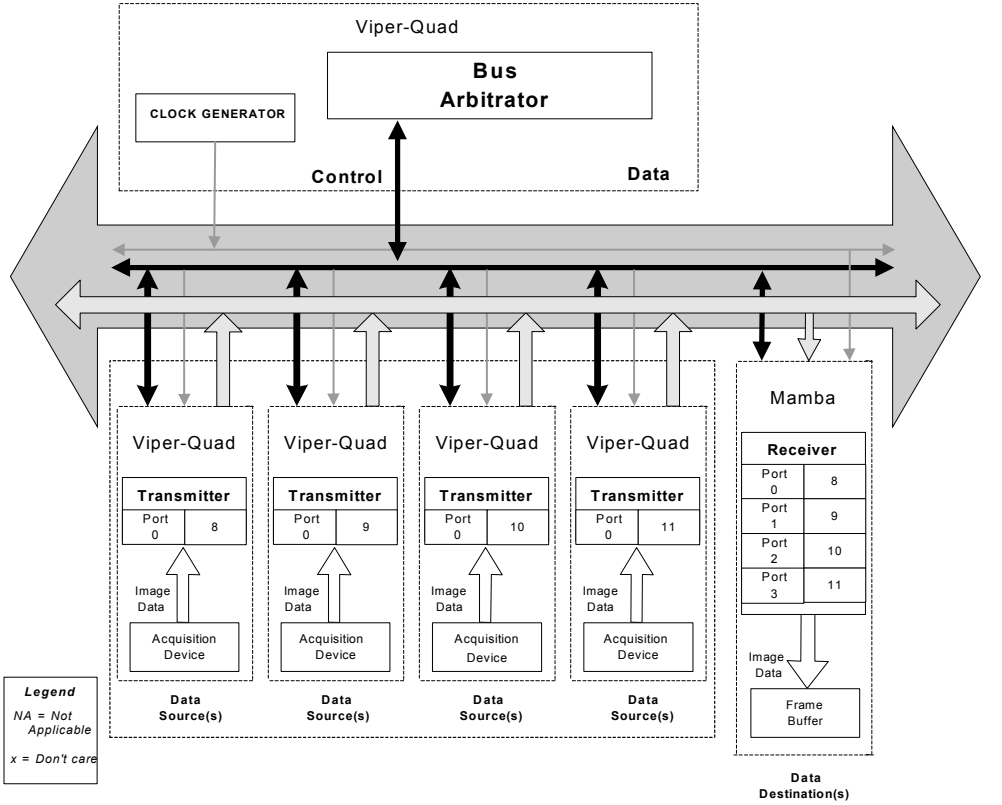
Viper-Quad/Mamba in Point-to-Point Mode

Using Viper-Quad and Mamba in Point to Point Mode

Hardware Connection Diagram



CAB System View



Coreco Imaging Contact Information

Sales Information

Coreco Imaging contact information.

Corporate Headquarters

Coreco Imaging
7075 Place Robert-Joncas
Suite 142
St. Laurent, Quebec, Canada
H4M 2Z2

Tel: (514) 333-1301
Fax: (514) 333-1388

US Sales Office

Coreco Imaging Inc.
Building 8, Floor 2
900 Middlesex Turnpike
Billerica, Ma. 01821

Tel: (978) 670-2000
Fax: (978) 670-2010

Visit our web site:	http://www.imaging.com
Email:	info@corecoimaging.com

Technical Support

Technical support requests for imaging product installations and help with imaging applications can be made at:

United States:	(978) 670-2000
International:	(514) 333-1301

Technical support requests for all camera related questions can be made at:

US & International:	(514) 333-1301

Or all requests can be submitted via our web site:	http://www.imaging.com/support
For product literature and driver updates:	http://www.imaging.com/download

Appendix: Dummy Buffer Type

Dummy Buffers

No memory is allocated for a dummy buffer in order that it does not contain any data elements. However, all of its size and format parameters are still valid. This means that any Sapera functionality from other modules that need access to buffer data elements will not work. The only exception is the Transfer module, which may use dummy buffers as placeholders when no data is to be physically transferred.

This section illustrates the concept of dummy buffers that are used with Mambas to simplify CAB configuration. The dummy buffers make the CAB more flexible. One benefit being overlapping support. The objective is to configure the CAB in multicast mode and with each Mamba select only the relevant data from the CAB and ignore the rest.

Requirements:

- Requires Sapera 4.10 or later.
- Requires Mamba driver 4.10 or later.

How does it work

In multicast mode, each Mamba receives all camera data output via the CAB. Each Mamba determines the specific data it receives. This is accomplished by creating a list of buffers of varying size. Some are dummies while the remainder are regular buffers. Note that dummy buffers are not allocated in Mamba memory. The transfer object requires the dummy buffers to know how much data it flushes from the Cab. The Mamba CPU performance is not affected during this process because no memory cycles are performed to Mamba memory during the transfer of dummy buffers.

How it looks in user applications

Example:

A linescan camera outputs images 2k x 12k, two Mambas each processing part of the image.

On Mamba #1:

```
// Create the appropriate buffers
CorBufferNew(hPC,2k,3K,CORBUFFER_VAL_FORMAT_MONO8,
CORBUFFER_PRM_TYPE_SCATTER_GATHER,&hBuffer1);

// Now create the dummy buffer to skip the next 9k lines
CorBufferNew(hPC,2k,9K, CORBUFFER_VAL_FORMAT_MONO8,
CORBUFFER_PRM_TYPE_DUMMY,&hBuffer2);

// Now create the Xfer objet
CorXferNew(hPC,hCab, hBuffer1, pXferDesc,&hXfer)   // Xfer to the real buffer
CorXferAppend (hPC,hCab,hBuffer2, pXferDesc) // Xfer to dummy buffer
```

On Mamba #2:

```
// Decide on a different configuration for each Mamba
// Each Mamba is independant
// Create the appropriate buffers: 2 real buffers and 3 dummies.

// Skip the first 1k line
CorBufferNew(hPC,2k,1K,CORBUFFER_VAL_FORMAT_MONO8,
CORBUFFER_PRM_TYPE_DUMMY,&hBuffer1);

// Get the next 3K lines
CorBufferNew(hPC,2k,3K, CORBUFFER_VAL_FORMAT_MONO8,
CORBUFFER_PRM_TYPE_SCATTER_GATHER,&hBuffer2);

// Skip the next 2k lines
CorBufferNew(hPC,2k,2K,CORBUFFER_VAL_FORMAT_MONO8,
CORBUFFER_PRM_TYPE_DUMMY,&hBuffer3);

// Get the next 1K line
CorBufferNew(hPC,2k,1K, CORBUFFER_VAL_FORMAT_MONO8,
CORBUFFER_PRM_TYPE_SCATTER_GATHER,&hBuffer4);

// Skip the next 5k lines …the total lines must add up to 12K for this example.
CorBufferNew(hPC,2k,5K,CORBUFFER_VAL_FORMAT_MONO8,
CORBUFFER_PRM_TYPE_DUMMY,&hBuffer5);


// Now create the Xfer object
CorXferNew(hPC,hCab, hBuffer1, pXferDesc,&hXfer)   // Xfer to the dummy buffer
CorXferAppend (hPC,hCab,hBuffer2, pXferDesc) //  Xfer to real buffer CorXferAppend
(hPC,hCab,hBuffer3, pXferDesc)    // Xfer to dummy buffer
CorXferAppend (hPC,hCab,hBuffer4, pXferDesc) // Xfer to real buffer
CorXferAppend (hPC,hCab,hBuffer5, pXferDesc) // Xfer to dummy buffer
```

Glossary of Terms

Channel

A channel is a data path from a camera that includes an entire video line.

Complex Parameter

A parameter with a size greater than an UINT32.

Pixel

A single picture element, the smallest individual digital video component. The number of pixels describes the number of digital samples taken of the analog video signal. The number of pixels per video line by the number of active video lines describes the acquisition image resolution. The binary size of each pixel (i.e., 8 bits, 15 bits, 24 bits) defines the number of gray levels or colors possible for each pixel.

Simple Parameter

A parameter with a size less than or equal to an UINT32.

Index

B

Bus Arbitrator 4–5, 11, 14, 19

C

CAB arbitrator 13
CAB hardware specifications 4
CAB interface 3, 5–7, 10–11
CAB-LINK 10
Channels 5, 19
Clock 5, 10
clock generator 5
CORCAB_CAP_BLOCK_SIZE_MAX 21
CORCAB_CAP_BLOCK_SIZE_MIN 21
CORCAB_CAP_CHANNEL_COUNT 21
CORCAB_CAP_CLK_MAX 21
CORCAB_CAP_CLK_MIN 22
CORCAB_CAP_PORT 22
CORCAB_CAP_PORT_COUNT 23
CORCAB_PRM_BLOCK_SIZE 23
CORCAB_PRM_CAB_ARBITRATOR 25
CORCAB_PRM_CAB_CLK 24
CORCAB_PRM_CAB_CLK_GENERATOR 24
CORCAB_PRM_CAB_ID 25
CORCAB_PRM_CHANNEL 25
CORCAB_PRM_CONNECTION_SIGNAL 26
CORCAB_PRM_DST_CHANNEL 27
CORCAB_PRM_DST_CHANNEL_FIRST 27
CORCAB_PRM_DST_CHANNEL_LAST 27
CORCAB_PRM_FRAME_LENGTH 27
CORCAB_PRM_PORT_INDEX 28
CORCAB_PRM_SRC_CHANNEL_FIRST 28
CORCAB_PRM_SRC_CHANNEL_LAST 28
CORCAB_PRM_STATUS 28
CORCAB_PRM_TRANS_MODE 29
CORCAB_PRM_TRANSFER_MODE 29
CorCabGetCap 30
CorCabGetCount 30
CorCabGetHandle 30
CorCabGetPrm 31
CorCabGetPrms 31
CorCabRelease 31
CorCabReset 32
CorCabResetModule 32
CorCabSetPrm 32
CorCabSetPrmEx 34
CorCabSetPrms 33
Coreco Auxiliary Bus 21

D

data bus 4
device driver 13
Dummy Buffers 53
dynamic configuration 9, 14

E

embedded vision processing 3

J

jumper 10

M

Mamba-100 5, 11
Multicast 5–6, 16
Multicast Mode 6

P

PCI bus 3
Point-to-Point 5–6, 18
Point-to-Point Mode 6
port capabilities 7, 20
Ports 4–7
processing nodes 5

R

receiver 5, 19
Round-Robin 17

Round-Robin Mode 6
RX port 5

S

Sapera 9–10, 13–14, 19, 20
serial number 10
skeleton code 14, 19, 20
Static Configuration 9–11

T

technical support 52
transmitter 4–5, 14, 16–18
TX port 5

W

Web 13
Web site 1